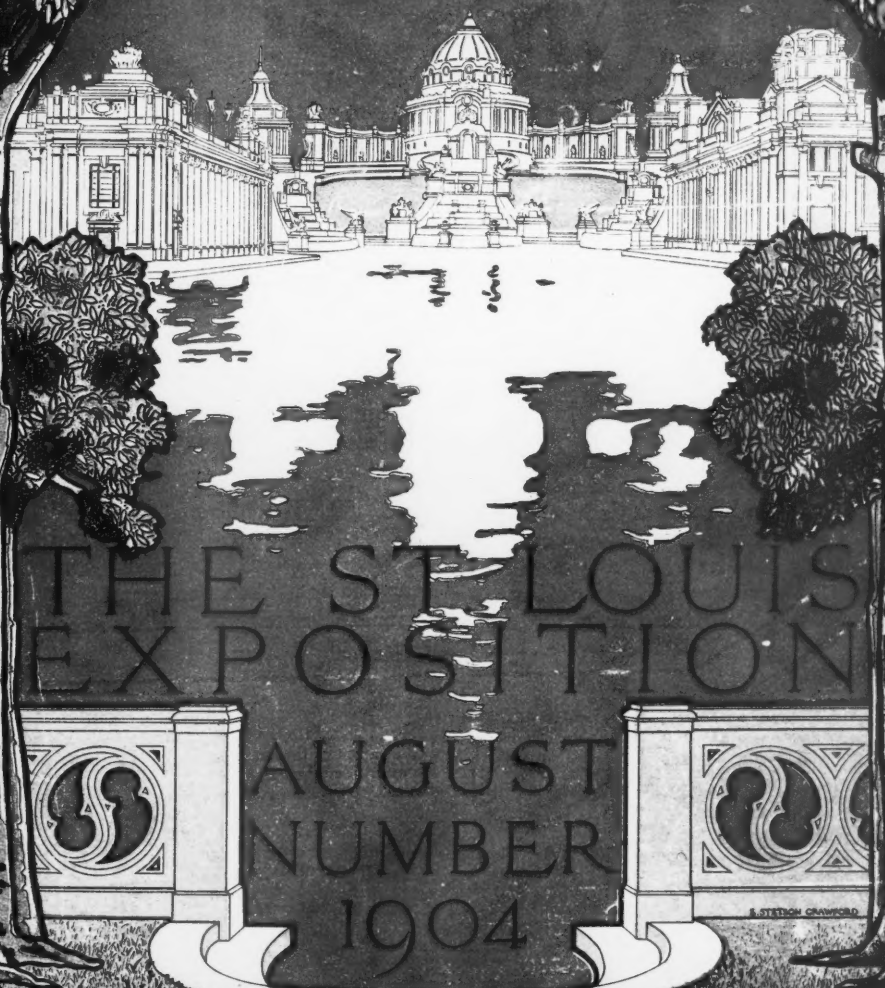
SPECIAL DOUBLE EXPOSITION NUMBER

THE WORLD'S WORK



THE ST. LOUIS EXPOSITION

AUGUST NUMBER 1904

DOUBLEDAY, PAGE & COMPANY, NEW YORK
WILLIAM HEINEMANN, LONDON

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World's Work, No. 12

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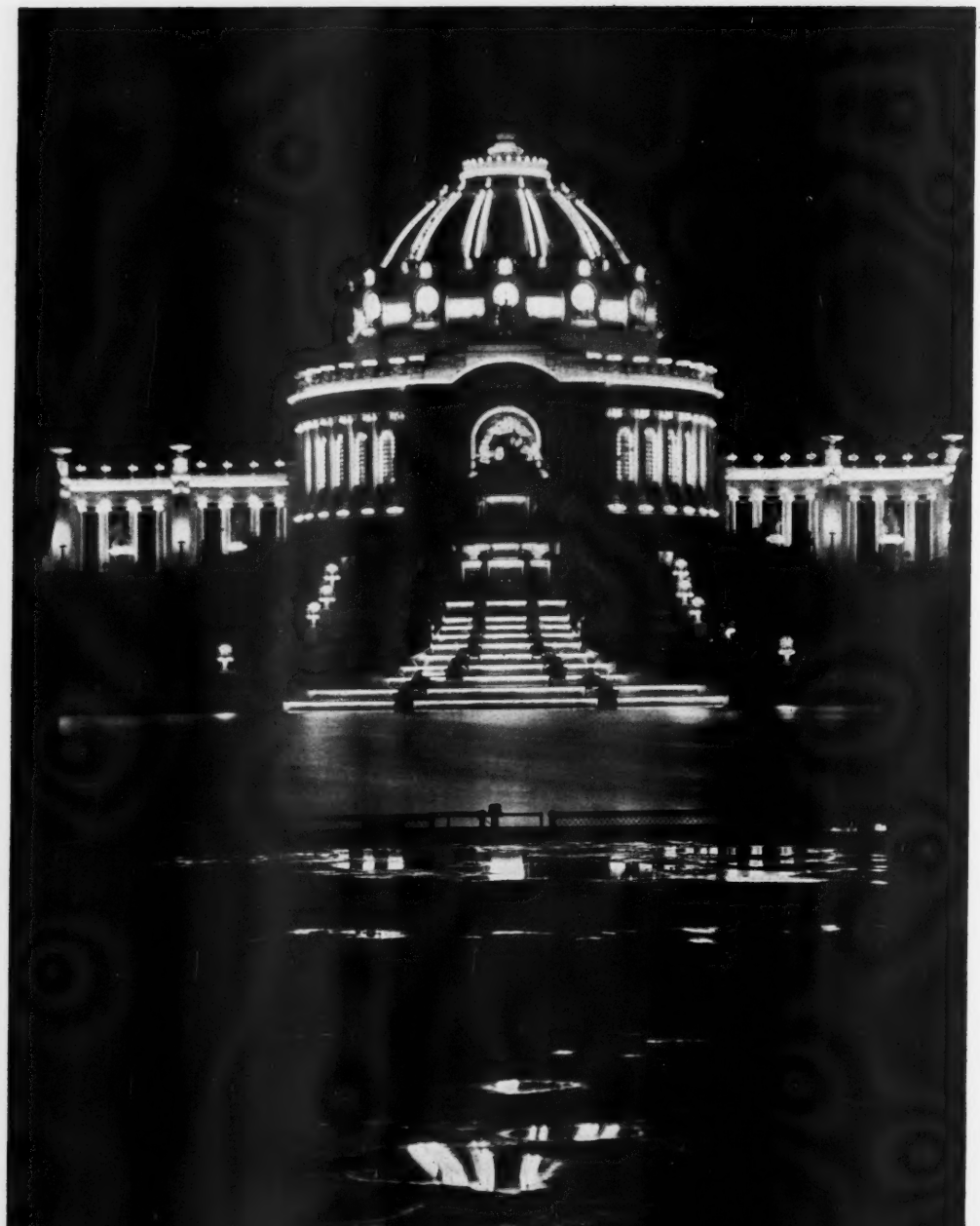


A VIEW OF FESTIVAL HALL AND THE COLONNADE OF STATES AT NIGHT

This is the central spectacle of the Fair, and from this radiate the successions of palaces that contain the principal exhibits

THE WORLD'S WORK

AUGUST, 1904

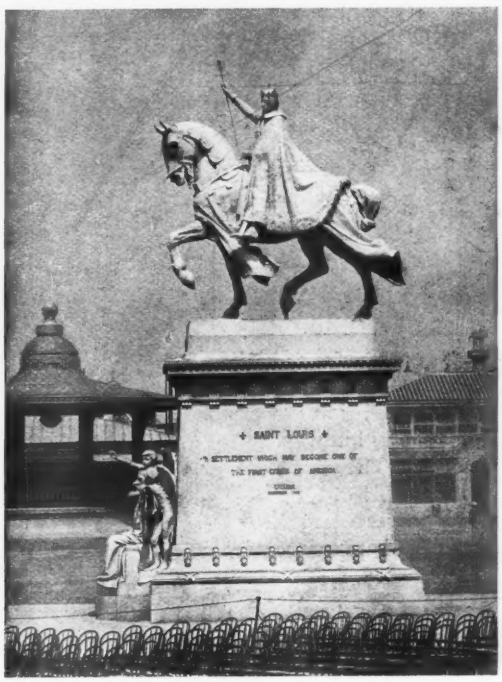
VOLUME VIII NUMBER 4

The World's Fair at St. Louis

THIS number of THE WORLD'S WORK is made to serve the purpose of a guide, philosopher, and friend for those that go to see the World's Fair at St. Louis, and a faithful report of it for those who do not go. The articles and illustrations that follow were written and taken by the members of the magazine's staff, after a month's study.

The Fair is more variously instructive than any of its predecessors, and it will richly repay intelligent study. It gives a worthy representation of the condition of the arts and industries of the world at the beginning of the twentieth century, on a scale of unprecedented magnitude. It presents, also, a great variety of splendid spectacles, as well as of subjects of instructive study; and every alert and ambitious person who can go to see it ought to spend a week there—a fortnight if possible.

The bigness of the Fair is the first fact that strikes the visitor, and it is the fact that will remain longest in his memory. Immense distances, buildings so large that you have to make a new standard of measurement, and an endless variety of things to see — these at first produce an impression of bewilderment. You may have read the statistics of all recent great fairs, which show how much more extensive and costly this is than any of its predecessors was; but you do not comprehend the bigness of it till you come into it. The truth is, it is larger than man's stature—so much larger than the buildings and the fairs and the machines and the displays of things to which we are accustomed, that the



THE STATUE OF SAINT LOUIS
By Charles H. Niehaus

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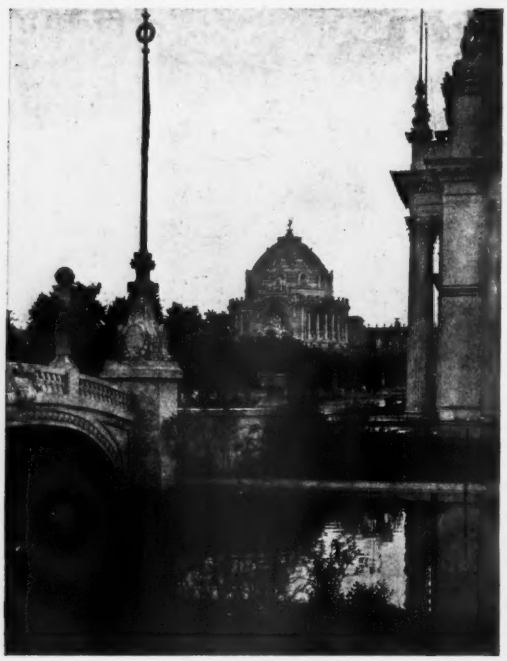
first experience of the visitor is likely to be unsatisfactory. Consider, for instance, the building given to Agriculture. You may walk nine miles in it without retracing your steps.

Now the first effect of this hugeness is to disturb our usual standards of measurement. But presently the magnitude of the subjects dawns upon you—the subjects treated at the Fair; for the Fair is a colossal work of art, a method of expressing the large facts of industrial activity. Regarded in this way, you may study (again to use the Palace of Agriculture as an example) the large facts of our



FESTIVAL HALL
From the east corner of the Palace of Education

food-production on a scale of exhibition never before made possible. Everybody knows that corn is our most valuable crop. The statistics of it are as dull as any other table of figures. But the display of Corn in acres of artistic designs, in colossal domes and pillars and portières, and in great piles of ears, and of all the products of corn (for there are perhaps a hundred such products)—acres of impressive designs and arrangements—all this does bring to any man who has the least imagination the feeling of inexhaustible plenty, of the measureless richness of our continent.

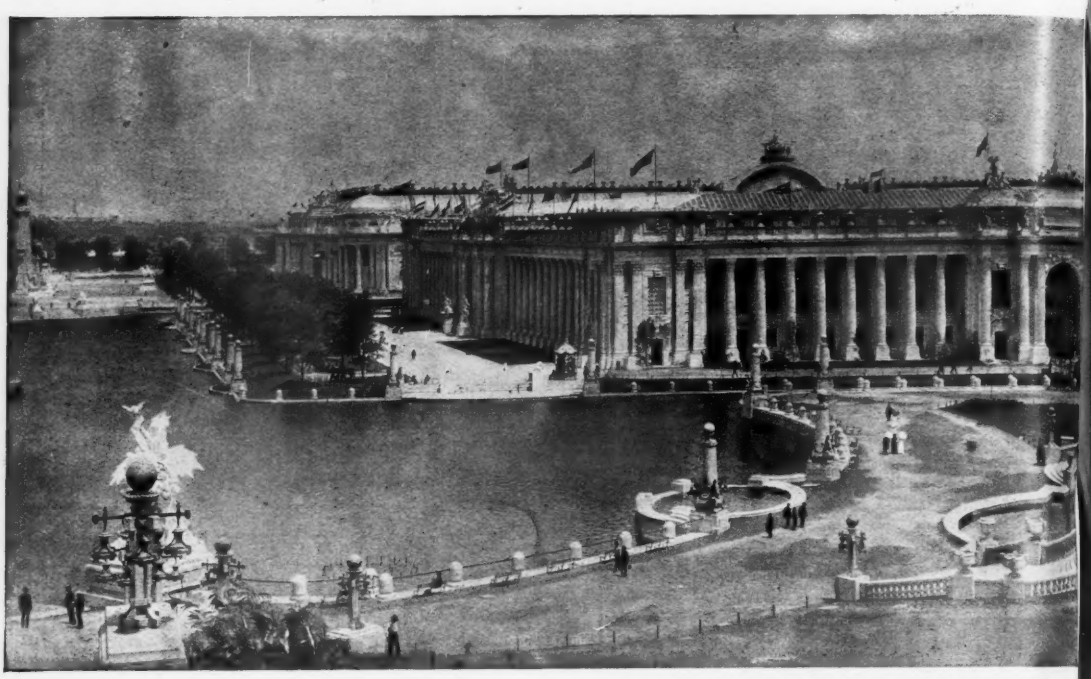
What has been done for Corn has been done

FESTIVAL HALL
While the fountains are playing

FESTIVAL HALL
Seen from the Louisiana Purchase Monument

A DAYLIGHT VIEW OF FESTIVAL HALL AND THE CENTRAL CASCADE

The hall is 200 feet high and seats 3,500 persons. The cascades have a fall of 90 feet



VIEW FROM HALF-WAY UP THE CASCADE

The Palace of Education in the centre; the Palace of Mines to the right; the Palace of Manufactures in the background.

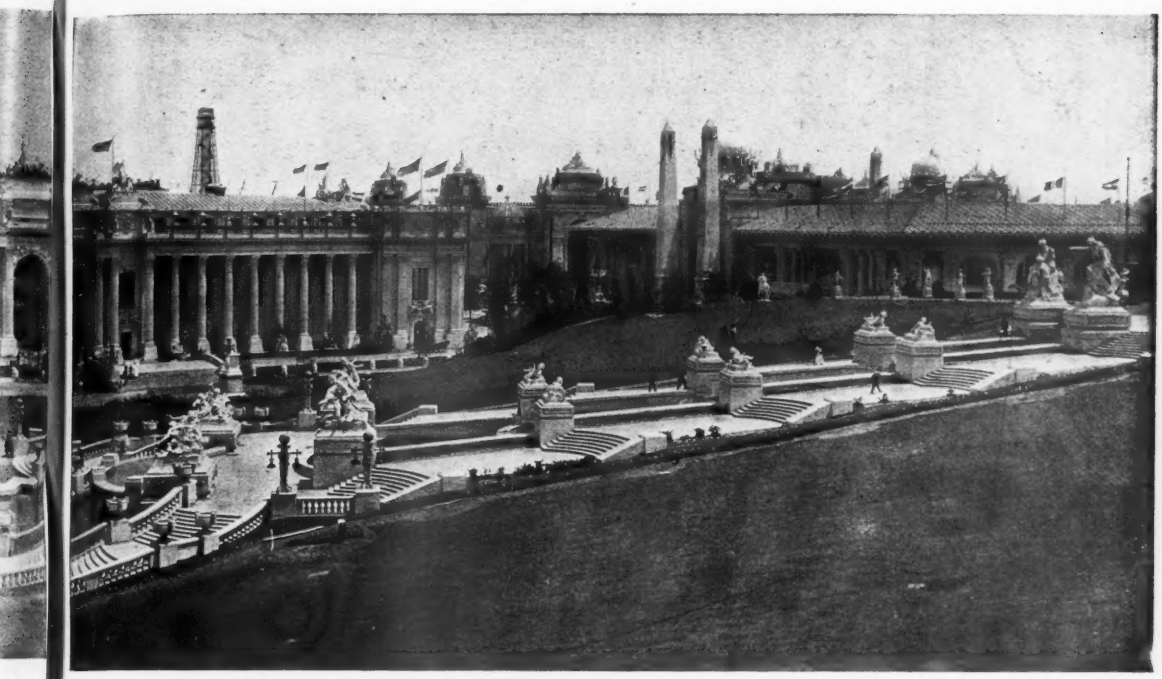
for Transportation also; for Electricity; for the Philippine peoples and their industries—for many other things. The bigness of the Fair, therefore, has a meaning, a use, and a justification. Great spaces are necessary to show great products and important processes. So large are we grown, and so various are the modern industries of the world, that a new scale of measurement is necessary. It is the first time that the products and industries of our country have been exhibited on a sufficiently large scale to give a correct idea of them.

THE VARIETY AND BEAUTY OF THE FAIR

THE next fact that strikes you is the variety of the Fair. There may be things—industries and products—that are not shown here; but no one will wish for more sights to see. All countries and all kinds of industries and of products are not shown with the same fullness. Some important countries are hardly represented—Russia and Spain, for examples; and some parts of the Fair are better and fuller than other parts. But it is nearly enough complete to satisfy any expectation or ambition.

Big enough and complete enough, it is also beautiful enough. You will meet men who prefer a more compact spectacle, such as the Court of Honor was at the Chicago Fair in 1893, or the brilliantly colored and illuminated court at Buffalo; for there is nothing compact at St. Louis. But the great Fair has a beauty of its own—rather, it has many beautiful views. You do not see one splendid spectacle and there come to the end of your quest. There are dozens of fine spectacles that you may discover for yourself—vistas that you did not get a hint of on the first day. The Plaza of St. Louis is the central spectacle; but it is not the only one: many visitors will find others that are quite as beautiful. Instead of one central spectacle only, then, this Fair presents a variety of vistas. It will please you at the end of a week better than it will please you on the first day; and better at the end of a fortnight than at the end of a week. It requires time to assimilate it. No one ever before saw so large an illuminated area as these great buildings at night and the long vistas between them.

It is worth while to remark at the very beginning that the least helpful speculation that one can indulge in, or listen to, is a comparison of one great fair with another. This is not like any other. It differs radically by reason of its bigness and of its variety.



HILL OVERLOOKING THE GRAND BASIN

One of the side approaches to Festival Hall, showing the lawn and the architectural and sculptural effects

"It does not wholly satisfy us," said one of the active directors. "We are disappointed in many details. Some of our plans have not been carried out, others have been modified. But, after a month's study of it all, the total impression has become satisfactory; and I am sure that it is the most instructive and interesting, because it is the latest and largest, of great fairs."

Thus, the first impression of bewilderment gives way to wonder and at last to a new conception of the magnitude, the variety, and the richness of our land and of our people. Any American citizen who studies it all intelligently will carry away a new and enlarged notion of his country, of his countrymen, and of the time in which he lives; for the Fair is the best ocular expression of these large facts that has ever been made—a fit thing to show for the vast sum of fifty million dollars that was spent in getting it together.

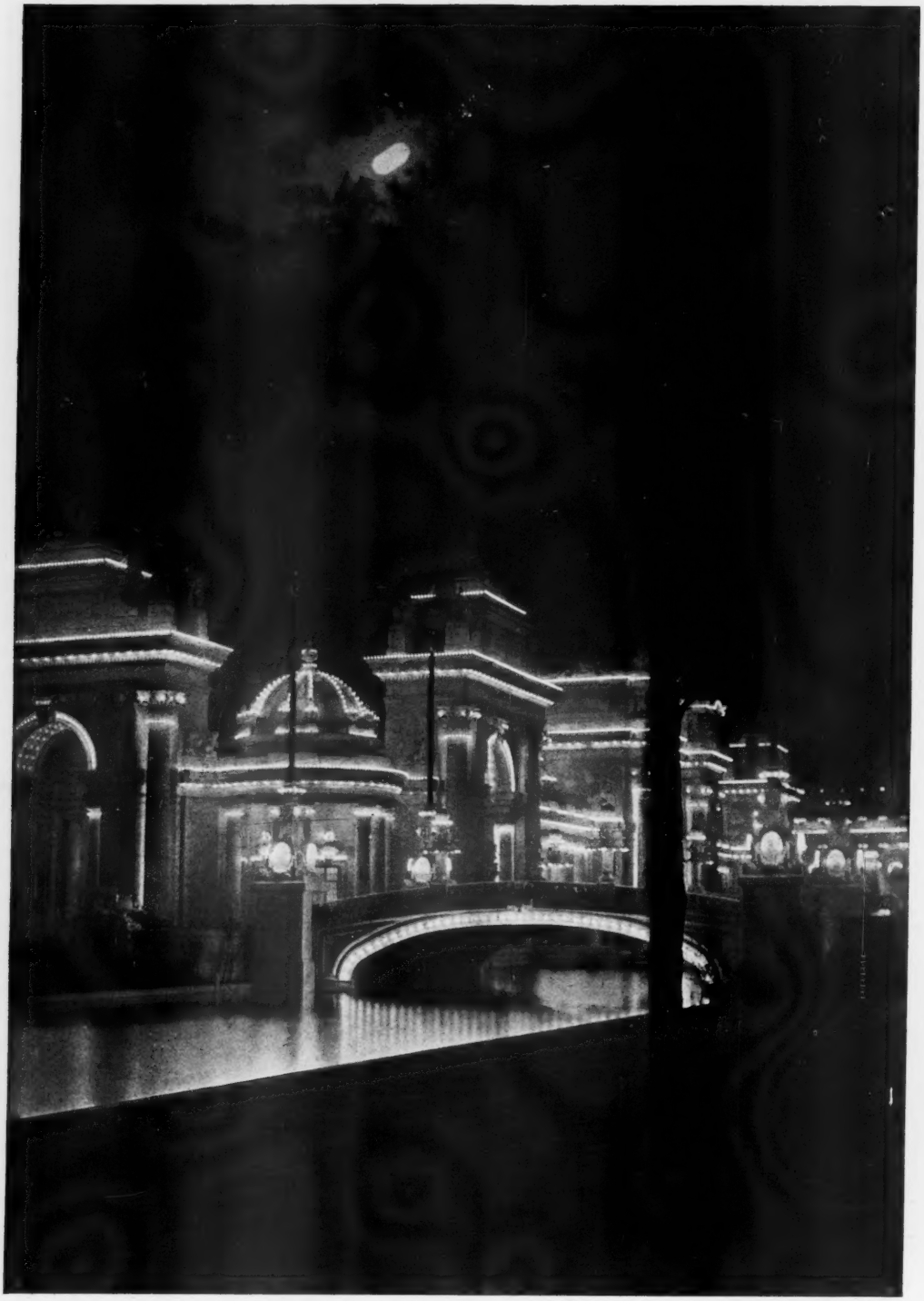
THE LOGICAL ORDER OF SUBJECTS

THERE are many good itineraries that could be made for a visitor—for a two-days' visit, for a week's visit, or for a fortnight's; and such orderly suggestions are made in another place in this magazine. But a logical order of study for one who wishes to comprehend the larger meaning of the whole scheme is this:

First, Power and Electricity and Machinery. The machines that turn and light the Fair mark a new era in the use of electricity.

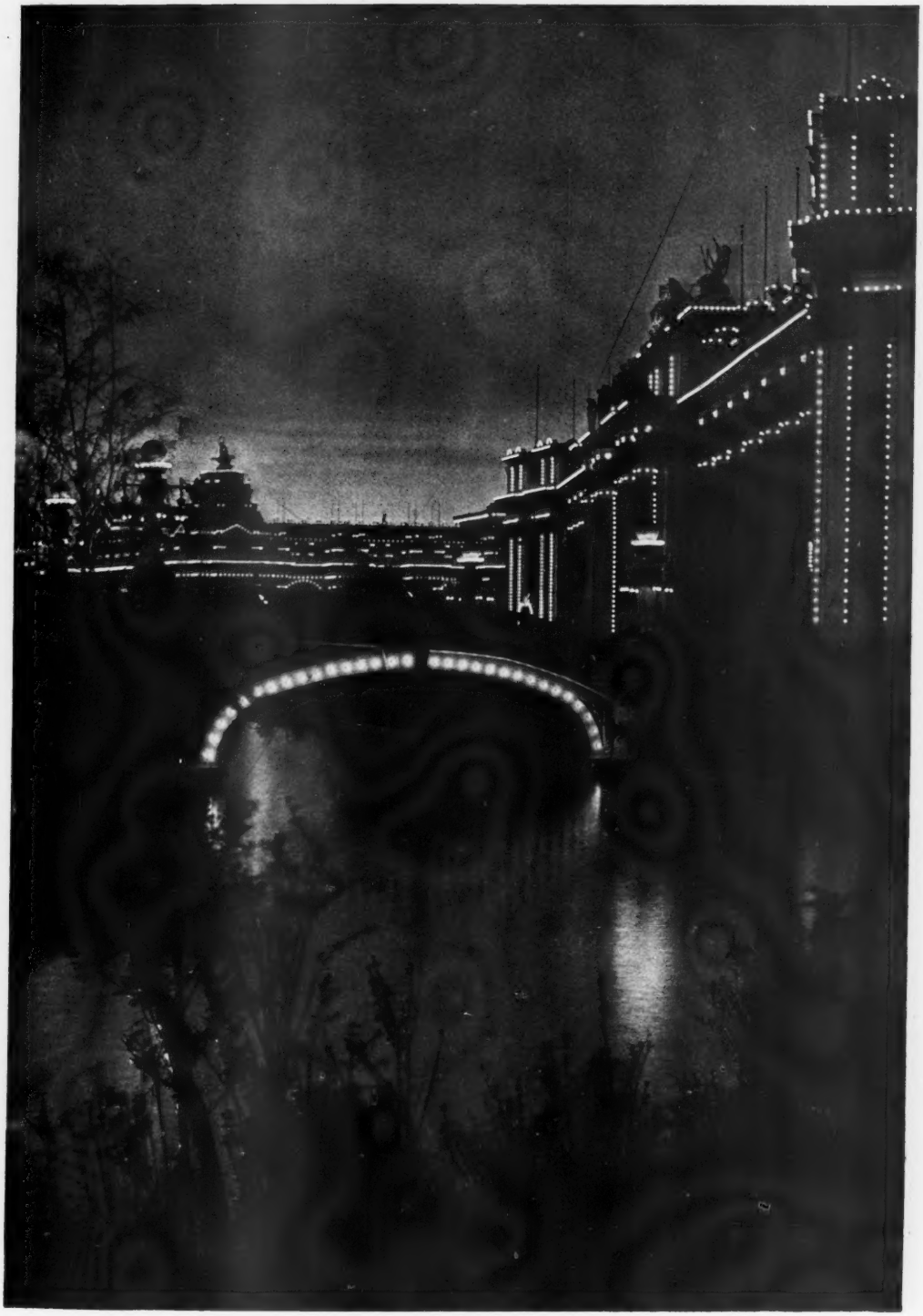
Next, of course, would come the Transportation exhibit, which is interesting, both for its historical value (it shows the development of transportation at every stage from the most primitive methods to the most powerful locomotives ever built) and for the instruction it gives about the most advanced machinery. At the Chicago Fair, steam-power was exhibited almost at its zenith; at Buffalo, there was a brilliant burst of electric light and energy; at St. Louis, although a very considerable advance is shown in steam machinery, for the first time electricity is the dominant power. It may well turn out that the new age of Electricity—as in a sense superseding steam—will date from this Fair. The public will, for the first time, be made aware of the extent to which such a new era has already come.

Next, in logical order, comes the great Agricultural display, indoors and outdoors. For the first time in expositions, enough space



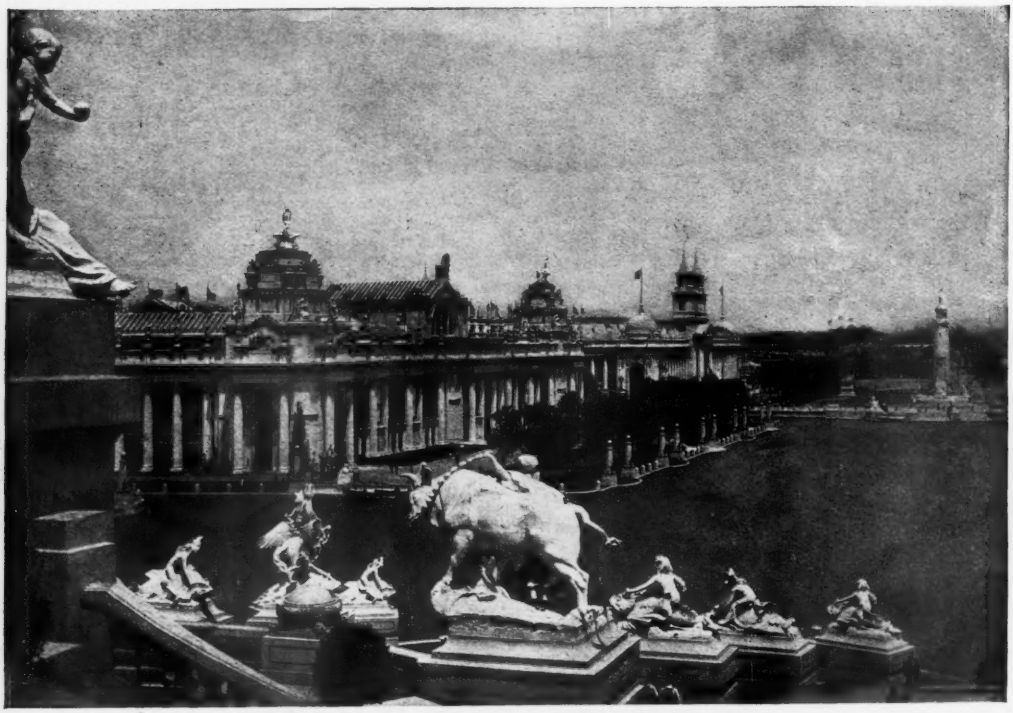
PALACE OF LIBERAL ARTS BY MOONLIGHT, SEEN FROM THE PALACE OF EDUCATION

The flattened shape of the moon is due to the fact of the long exposure, during which the moon moved. The photograph is untouched



A CANAL VIEW AT NIGHT

The Palace of Electricity in the center, the Palace of Education to the right



THE PALACE OF ELECTRICITY FROM CASCADE HILL
The group of sculpture in front by H. A. Mac Neil

A PORTAL OF THE PALACE OF MANUFACTURES
Architects, Carrere & Hastings, New York. The quadriga over the arch is by J. A. Laurie; side groups by Isidore Konti; the fountains below by Philip Martiny

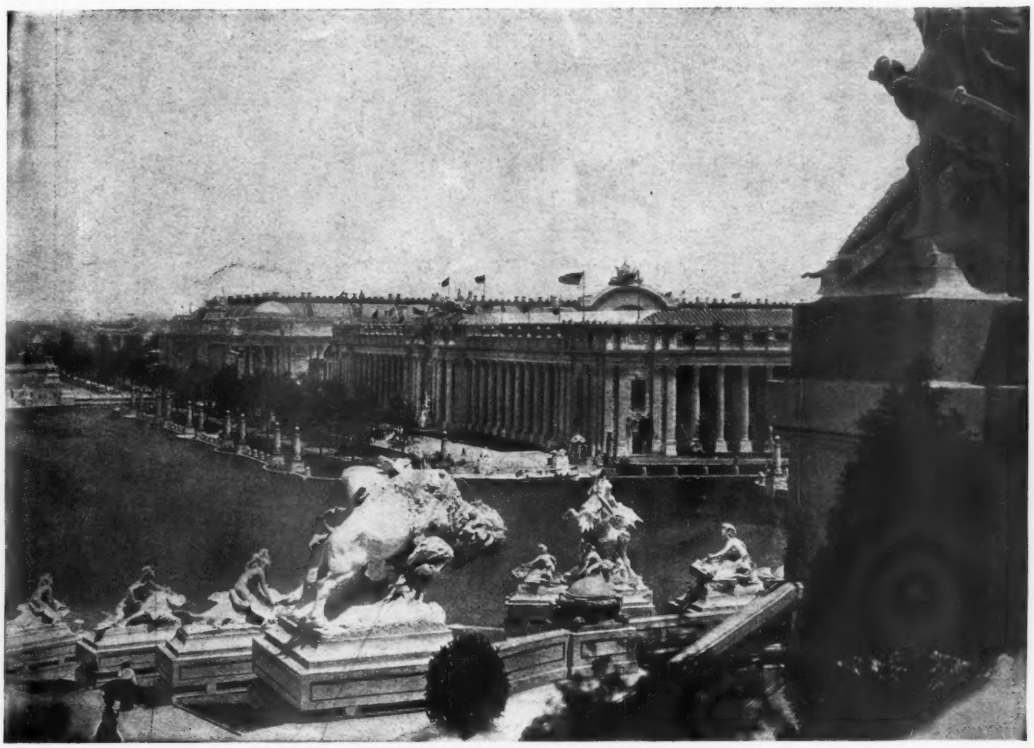
has been used to express our agriculture in adequate terms. Mining comes next.

Then the processes, some of which are seen in nearly all the buildings and many of which are in the outdoor part of the Fair.

This order of subjects thus far—which is not necessarily the best order of examination, but is the logical order in comprehending the Fair as a whole—has covered the power and the larger natural products. Next would come, of course, the manufactured products, from such things as are shown in the Palace of Varied Industries to the contents of the Palace of Fine Arts.

Among the most original and novel great exhibits—things that every one who is interested in such subjects should not fail to see, are:

The Fair at night, including a ride in a gondola to observe the illuminations and the reflections; including also a ride on the intramural railway, both during the day and at night; and a ride on one of the automobiles that make frequent journeys around all the most interesting buildings. So much for general views of the spectacle.



A VIEW FROM CASCADE HILL

Showing sculpture by H. A. Mac Neil; the Palaces of Education and of Manufactures

The Filipino Reservation. This will be, to many visitors, the most interesting part of the whole Fair. You can learn more there in a day about the archipelago, its peoples, its products, and the problems of our government than you could learn in months of travel.

Of the foreign exhibits, the German and the Japanese are the best, the most elaborate, and the most instructive. The American public has never before had such an opportunity to study Japanese products and industries, Japan and the Japanese. A visit to the Japanese pavilion on the hill is one of the pleasantest experiences of the whole Fair.

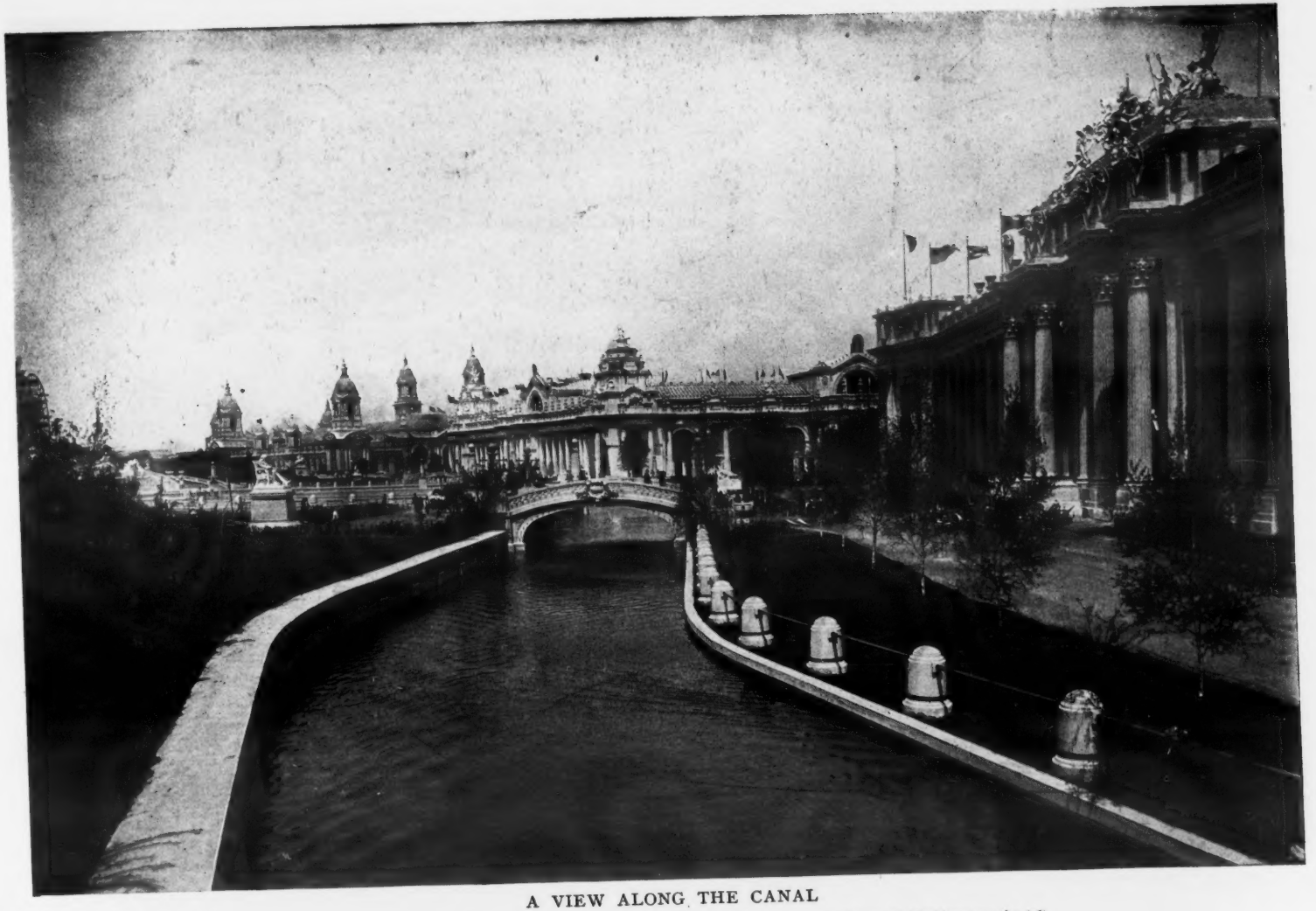
These suggestions are, of course, not meant to be complete. They are merely general suggestions. Others, in greater detail, are published elsewhere. The foregoing are only some of the large subjects that are most worthily set forth.

THE PALACE OF TRANSPORTATION

One of three arches that form the main entrance

THE BEAUTY OF THE GENERAL SPECTACLE

THE visitor will note that the pivot upon which the whole plan of the Fair turns is the dome-topped structure of



A VIEW ALONG THE CANAL

The Palace of Education on the right: the Palace of Electricity in the center: the Palace of Machinery on the left

ALMOST THE SAME VIEW BY NIGHT

The Palaces of Electricity and Machinery

Festival Hall, finely situated upon a smoothly rising hill. On the plateau behind it stands the Palace of Fine Arts, while in front, on the level ground at the foot of the hill, is disposed the main group of exhibition palaces. A most important characteristic of the Exposition, distinguishing it from previous ones, is the undulating nature of a part of the ground. As far as possible, the natural beauties of Forest Park have been preserved. In the section of outdoor exhibits, the trees have been sacrificed considerably to the necessities of the case, but they abound with charming luxuriance amid the knolls and dells in the community of the State buildings, while the slopes of the high ground, descending in somewhat the form of an amphitheatre, have been admirably utilized to create the climax in the scheme of spectacular beauty. They offer an opportunity, which no previous exhibition has enjoyed, for a magnificent combination of cascades with sculpture and architecture, closing in the picture as one approaches it from the north with a spectacle of extraordinary grandeur.

The visitor will do well to arrange a special study of the scene, leisurely proceeding from the end of the great plaza near the Lindell Boulevard entrance. In the artistic planning of the Fair, this was evidently intended to be the approach of honor, and it is unfortunate that no formal structure announces the fact. It would have been a fitting preparation for the stateliness beyond, and of still further artistic importance to the vista when viewed from the opposite end; for now, as you stand on the terraces below Festival Hall, and look down the ranging dignity of the palaces, the impressiveness abruptly terminates, and beyond is the incongruous higgledy-piggledy at the commencement of the Pike.

THE LOUISIANA PURCHASE MONUMENT

Design by E. L. Masqueray; sculpture by Karl Bitter; on the left is the statue of Joliet, by A. Phimister Proctor

But, to return to our starting-point, the feature of distinction is the equestrian statue of St. Louis, which is a work of genuine merit. It is by the sculptor Charles H. Niehaus, who has supplied also the beautiful group which decorates the pedestal representing the "City of St. Louis and Guiding Spirits."

To our right and left, as we advance up the broad Plaza, are the colonnades of the palaces, respectively, of Varied Industries and of Manufactures. The immense length of

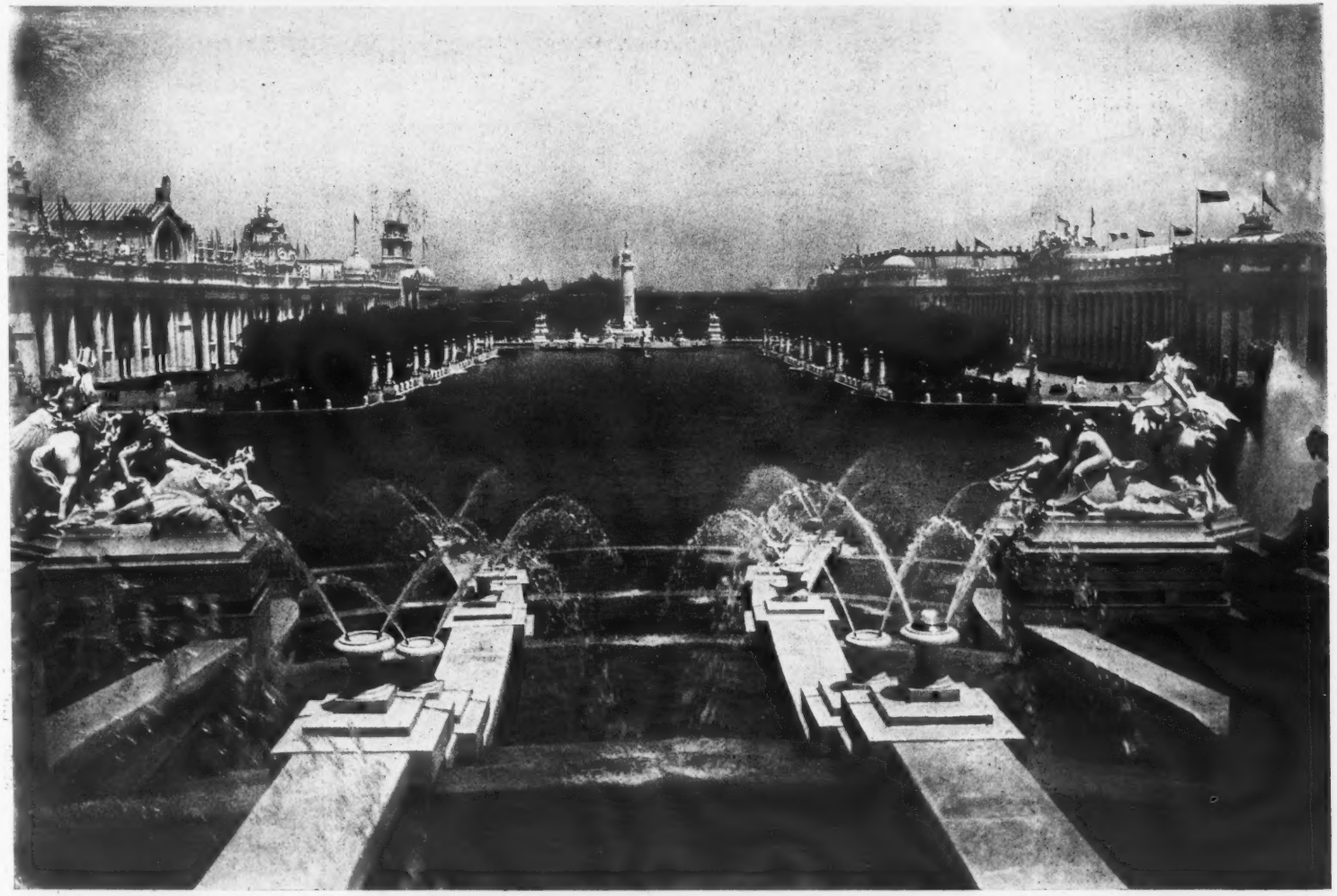
THE PALACE OF ELECTRICITY

Architects, Walker & Kimball, Boston and Omaha. Sculpture bv Bela L. Pratt

THE PALACE OF LIBERAL ARTS

Designed by Messrs. Barnett, Haynes & Barnett, of St. Louis. An adaptation of French Renaissance style

Designed by Messrs. Barnett, Haynes & Barnett, of St. Louis. An adaptation of French Renaissance style



A VIEW OF THE GRAND BASIN FROM THE CENTRAL CASCADE

The Palaces of Education and of Manufactures on the right; the Palaces of Electricity and of Varied Industries on the left. The Louisiana Purchase Monument at the end of the Basin

each rank of columns, though they represent only the shorter side of the irregular rectangle of the buildings, may prevent us from realizing the great height of these structures, and a glance into one of them, up to the network of timbers which support the roof, will cause surprise. Then, since the distance of vision is contracted, and the standard of comparison is limited to the size of ourselves in relation to exhibition booths which themselves seem high, we shall get a notion of the loftiness of the building. Outside, however, we view them in connection with the immense perspective of the whole, and it is worth while to notice that the height of the cornice line, which is practically uniform throughout all the palaces, has been very admirably adjusted to the proportion of the whole picture, so that, while every building is individually impressive, it does not assert itself at the expense of the vast impressiveness of the whole.

sculpture. More interesting, however, both artistically and in their relation to American life, are the four Western groups, by Solon H. Borglum, especially the "Cowboy Resting" and the "Pioneer Looking for Shelter." The sculptor himself began life as a cowboy; the freedom of the plains is in his blood, and he knows the life of men and of animals and is in full sympathy with it. Hence his work is extraordinarily realistic, besides having a remarkable relevancy to the event and conditions which this fair was meant to commemorate.

But, abandoning for a while the forward view, one should linger here to enjoy the vistas which open up to right and left. Again there is the grateful relief of water, mirroring the bridges, the verdure on the banks, and the ivory white of the balustrades and palaces; narrow water-ways, which are conducted round the huge palaces, encircling each upon a terraced island. It is here that the stateliness of the whole begins to blossom into vivaciousness and diversities of beauty, especially at night, for a curve in the façades of the buildings disperses the trim regularity of the lines of electric globes, following a little too tediously those of the architecture. At the same time, it scatters

Restaurant at one end of the Terrace of States

A PANORAMA TAKEN

The Palace of Machinery

AS SEEN FROM THE PLAZA OF ST. LOUIS

AT the end of the Plaza is the Louisiana Purchase Monument, a circular obelisk, decorated with figures and groups, by Karl Bitter, who, since the resignation of F. W. Ruckstuhl, has directed the making of the

them and blends them into a mazy swarm of brilliance. By daylight, also, this curve introduces a pleasing contrast to the straight vistas, the view to the left being particularly attractive, because it culminates in the United States Government Building, lifted up on the eastern slope of the amphitheatre and approached by broad flights of steps. With the exception of the main view of the cascades that we are gradually approaching, this one is the finest in the spectacular arrangement of the fair.

Not only is the structure an exceedingly handsome one—by far the most dignified

FROM FESTIVAL HILL

The Palace of Electricity — The Grand Basin

representation that the government has ever made in an exposition, and, in this respect, a notable example of the higher standards which prevail in the office of the supervising architect, under civil-service regulations and the direction of Mr. J. Knox Taylor—but the mere fact that a worthy building forms a terminal interest to the vista is itself of immense value to the decorative effect.

THE ASCENT TO FESTIVAL HALL

THE guiding thought of the architects of this exposition has been toward the Cascade, its sculptural embellishments and architectural frame, and so, toward the same point, let us continue our advance. At every step the picture broadens, until, from the terraces where the Grand Basin spreads out into a semicircular sheet of water, the beauty of the spectacle in its completeness is first revealed. Outspread is a vast fan of bevelled lawns, embroidered with flower-beds; its ribs three flashing breadths of water plunging down in successive leaps, between white walls of masonry, surmounted by balustrades, emphasized at intervals by spouting dolphins with children on their backs. The water which supplies the central channel glides in a smooth fall from an orifice in an elaborately sculptured grotto which stands in front of Festival Hall, the work of the sculptor H. A. Mac Neil, intended to symbolize the Triumph of Liberty; while the basin which forms the first pause in the rush of water is flanked by colossal groups, from the same sculptor's hand, representing an Indian in headlong chase of a buffalo and a woman leading a bull—the animals in each case being particularly worthy of study. The side cascades descend from two fountains, executed by Isidore Konti, to symbolize the Atlantic and the Pacific oceans. This spectacle of mingled energy and repose, of quiet lawns and speeding plash of water, of vivacious sculpture and steady flow of

THE PALACE OF MACHINERY

THE PALACE OF LIBERAL ARTS AND THE PALACE OF MINES

architectural lines, culminates against the skyline in the colonnade of the terrace of the States, which curves gently to right and left of the crown and apex of the whole scheme —the high, broad dome of Festival Hall. The decorative elaboration of this structure reaches its climax in the very attractive group of "Apollo and the Muses," by Philip Martiny.

One mounts to the top of the hill by curving stairways, bordered at intervals by portrait statues of pioneers and explorers and others famous in the history of the discovery and development of the Louisiana Purchase territory, to find that each of the colossal seated statues which stud the highest terrace symbolizes one of the States evolved from the territory. During the ascent, comprehension of the whole has been swallowed up in attention to the details of sculpture which have been lavishly expended here; and, even when you have reached the summit, the design of the cascades is no longer unfolded simply as it was from below. But now it is the backward view that fascinates one. As one gazes over the level stretch where the huge palaces repose, the roofs assert themselves, towers, domes, and pinnacles rise up to greet the eye, one sees these buildings better, and, as it seems, more near, than while he passed alongside of them; and four more, whose existence had only revealed itself in peeps, are now proclaimed. On our left are the Palaces of Machinery and of Transportation, and, over to the right, the Palaces of Education, of the Liberal Arts, and of Mines. Now, too, we can see, what the map had already told us, that the disposition of these buildings is on a fan-shaped plan, of which Festival Hall, that looms high above our heads, is the pivot.

Thus to make this building the pivot of the whole Fair was a happy thought, since it emphasizes the gala feeling which it is one of the chief purposes of a modern exposition to create, and which this one, in particular, had a right to enforce. For, back of the utilitarian and educational purpose of such an occasion as the present is the larger and the grander one of felicitation over the marvelous blessings which have poured themselves forth over the whole nation as a result of the event commemorated. And mean, indeed, must be a man's spirit, if, standing on this hill with the invigoration of wind and water all about him, and such grandeur of spectacle spread out beneath his feet, he does not give a thought to the inner meaning of all this beauty of material expression, and feel a pride in himself and in his country and the fullest motive for rejoicing.

Having by this time studied the spectacle so as to get at the character of it and the way in which its planners wished it to be seen; being, in fact, fairly masters of the situation, we are now able to enjoy it unreservedly. Now it is that we shall wander from place to place, not seeking to understand, but yielding ourselves to the impressions which everywhere throughout this vast scheme are waiting to woo our admiration. They are innumerable, varying according as we leisurely pace afoot, stopping continually before some fresh surprise of beauty, or still more leisurely sliding over the water in launch or gondola, getting, at every turn, an entirely new aspect of what we thought was familiar.

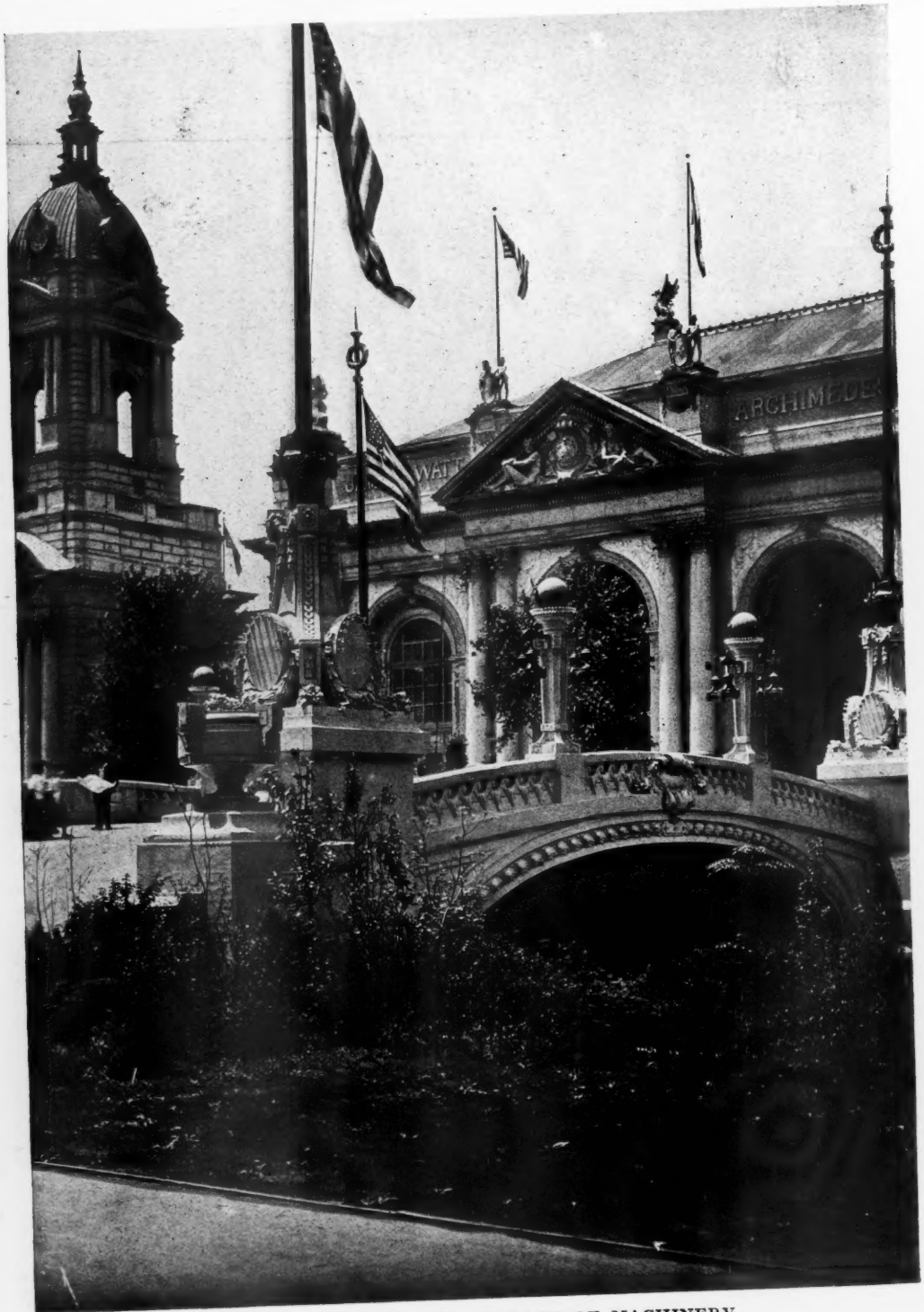
But best of all are the impressions at nighttime, when the architecture is outlined with countless lights. Even more beautiful is the effect when the lights upon the buildings are extinguished, and only the illumination of the bridges and walks remains, for then the palaces take on a spectral grandeur, a vague suggestiveness to one's imagination. Still and solemn, these huge masses wane fainter and more illusive in the distance, until, far ahead, the dome of Festival Hall rears like a spirit-shape into the impenetrable vault of sky, a shadowy gray against the violet—inscrutably aloof, and inspiring.

THE STATE AND FOREIGN BUILDINGS

OUTSIDE this central effect, the beautiful feature of the grounds is the group of State buildings, not only because of the natural charm of the wooded knolls and dells, threaded by broad driveways, in which they are situated, but also because of the intrinsic interest and artistic attractiveness that so many present. It is true that many are characteristic only of the architect's addiction to the more or less good and meaningful adaptation of classic styles of architecture—structures that, but for the names upon them, would be as little associated in one's imagination with one State as with another. But these are plentifully interspersed with designs that exhibit some originality of feeling or some definite reference to the individual State. Thus, most interesting examples of timber

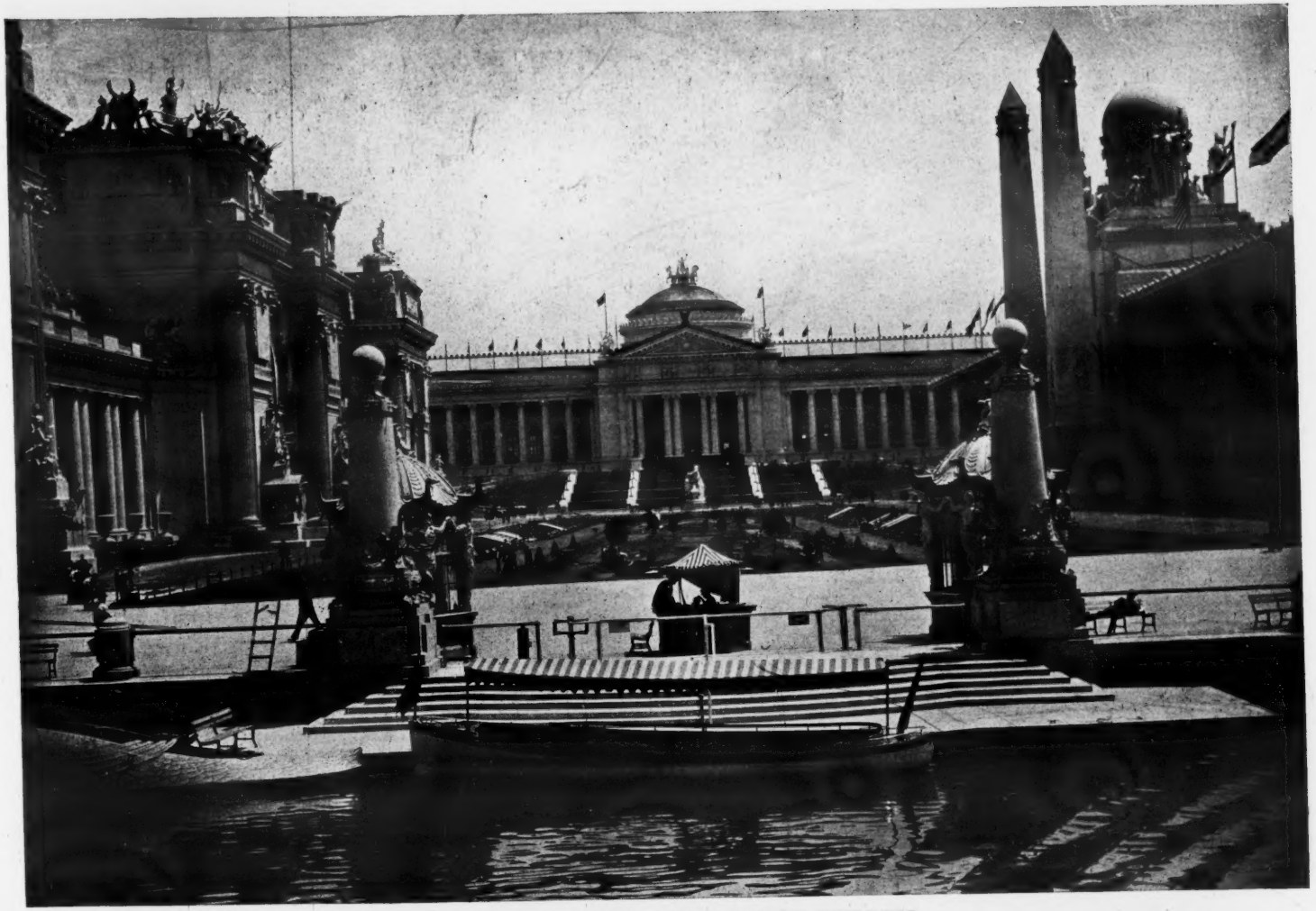
THE PALACE OF TRANSPORTATION

Designed by E. L. Masqueray. A bold adaptation of French Renaissance to the needs of a railroad terminus



THE EAST SIDE OF THE PALACE OF MACHINERY

A PORTAL OF THE PALACE OF MANUFACTURES



THE UNITED STATES GOVERNMENT BUILDING

Designed by Mr. J. Knox Taylor. The Palace of Mines on the right and the Palace of Liberal Arts on the left, it offers one of the handsomest terminals to a vista on the grounds

Designed by Mr. J. Knox Taylor. The Palace of Mines on the right and the Palace of Liberal Arts on the left, it offers one of the handsomest terminals to a vista on the grounds

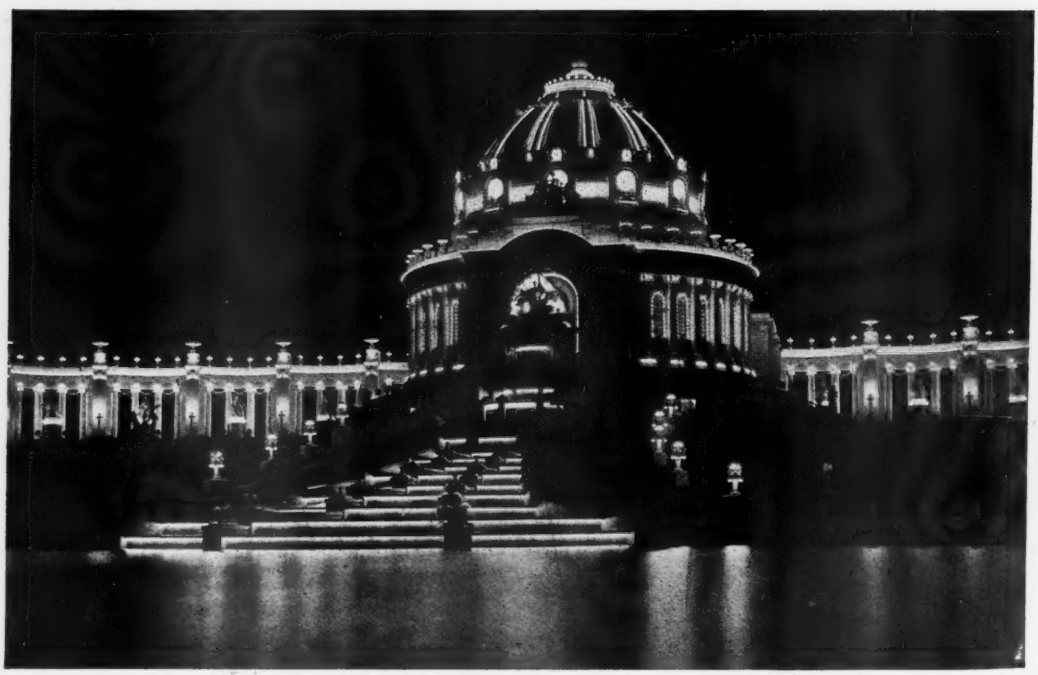
NIGHT VIEW FROM THE CANAL

Palaces of Varied Industries and Electricity and Louisiana Monument on the right; Grand Basin, with colonnade of lights, in the center; Palace of Manufactures on the left

construction are afforded by the buildings of Washington, Nevada, Maine, and Wisconsin. Louisiana's is a reproduction of the famous Cabildo as it was in 1803, when the transfer of the territory was made; while Connecticut's represents, on its exterior, the old Sigourney mansion at Hartford, and, in its interior details, the Slater house in Norwich. The California building is a replica of La Rabida, an old mission in the southern part of the State; Mississippi's, of Beauvoir, the mansion bequeathed to Jefferson Davis by Mrs. S. A. Dorsey; Tennessee's, of General Andrew Jackson's historic home, the Hermitage; while Oregon has reproduced the building and stockade of Fort Clatsop, occupied by Lewis and Clark in the winter of 1805–6; Massachusetts, a Colonial mansion; and New Jersey, the old Ford Tavern at Morristown, one of Washington's headquarters. Nor is it to the outside of these buildings only that interest and beauty attach. The interiors abound with fine old furniture, pottery, and metal ware, artistic products and relics of the past. Indeed, in no respect does this fair show such a marked advance upon Chicago's as in these State buildings, evidences at once of improved taste and of increased pride in the finest traditions of their history.

Similarly, many of the foreign buildings are reproductions: the German, of the Schloss Charlottenburg; the French, of the Petit Trianon; the Chinese, of the country house of a Chinese nobleman; and the British, of the Orangery at Kensington Palace. Both the German and the French are furnished with a profusion of articles of historic and artistic value, being veritable museums of the national handicrafts; while Sweden, in a modest way, but with charming taste, has arrayed the interior of her unpretentious building with examples of the skill and artistic feeling of her workers in wood, metal, pottery, and porcelain.

It remains to mention one more feature of the artistic ensemble—the Palace of Fine Arts, placed upon the high ground behind Festival Hall, where it will remain a permanent commemoration of the fair. It is a building of quiet impressiveness, erected in limestone; decorated with sculpture, notably with a statue of "Painting," by Louis Saint-Gaudens of "Sculpture," by Daniel C. French, and of "Truth," by Charles Grafly. Flanking it are temporary structures, housing the foreign



FESTIVAL HALL AND TERRACES OF STATES, ILLUMINATED

THE PALACE OF LIBERAL ARTS
Showing a portion of the Sunken Gardens

art exhibits, the whole group forming a mass of unmistakable dignity.

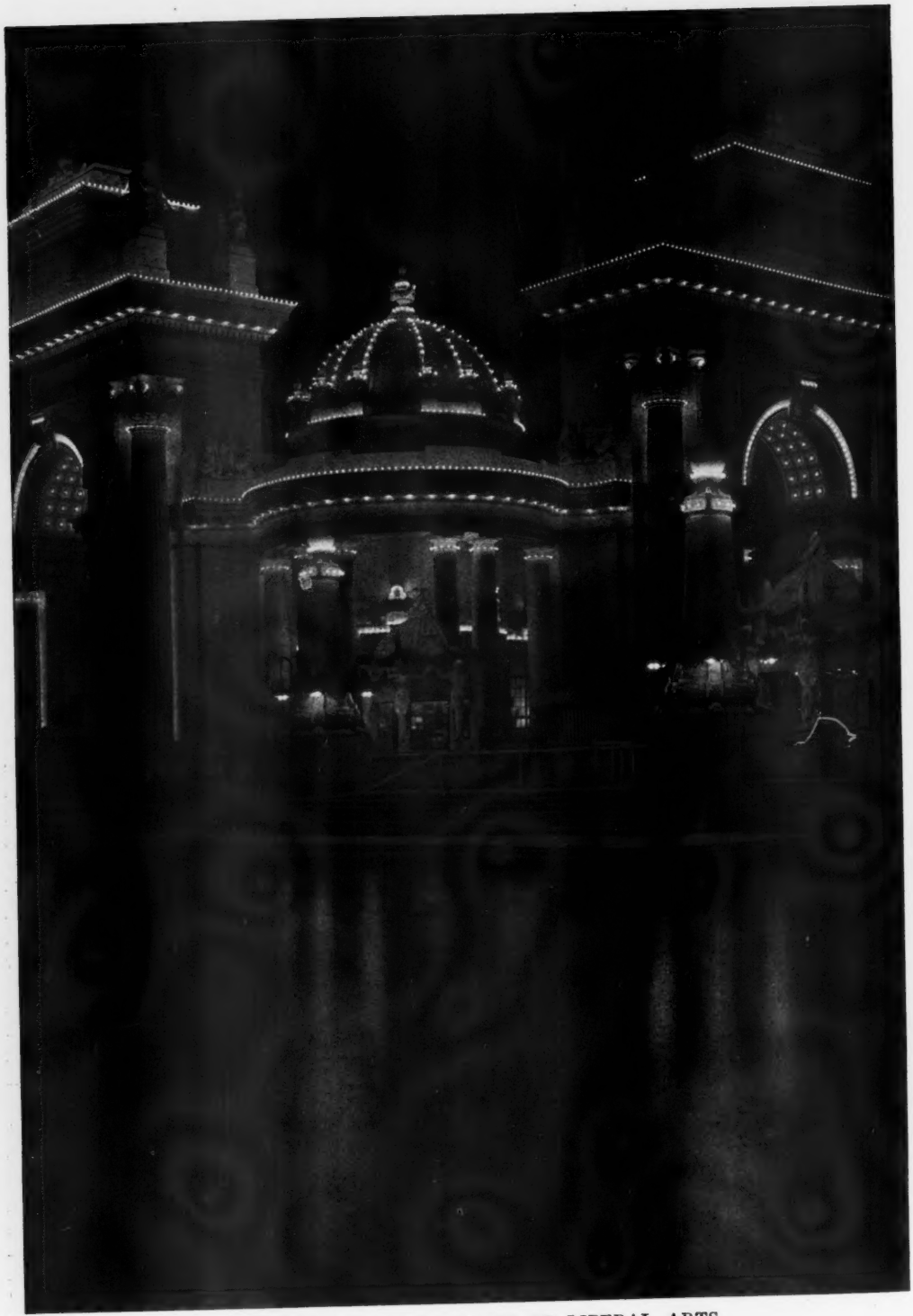
It might be interesting, though probably fruitless, to compare this exposition with others that have preceded it. It is at least different, both because of the nature of the ground and by reason of the advantage which has been taken of it; and it will remain in the memory of those who have the good fortune to see it a recollection of superb and diversified beauty.

WHAT THE FAIR COMMEMORATES

ON April 30, 1803, Jefferson bought the Territory of Louisiana from Napoleon. Napoleon was afraid that England, in the impending war, would capture Louisiana, and he needed money to meet the war's expenditures. The stupendous results of this transaction nobody foresaw. It more than doubled the area of the United States; it rendered inevitable all the acquisitions of territory that have taken place since; it made it certain that the United States and not England or any other country would dominate the Western Hemisphere; it gave the republican experiment a success and a prestige which have liberalized the political system of every other nation on the globe; and it established one of the great date-marks in world-history.

On April 29, 1803, the United States' western boundary was the Mississippi River, its southern border was an east and west line which struck the Mississippi a little below Natchez, and its area was 827,000 square miles. The next day, 875,000 square miles were added (nearly as large an area as England, Ireland, Scotland, Wales, France, Germany, Spain, the Netherlands and Belgium)—and the cost was only $15,000,000.

The effects of the purchase began to assert themselves quickly. Spain, in 1819, ceded to us East and West Florida (the present State of Florida, the southern ends of Alabama and Mississippi, and the eastern projection of the State of Louisiana). Moving from the Louisiana province soon afterward, Stephen Austin's colonies of Americans got the foothold in Texas which resulted in the wresting of that area from Mexico in 1836, its erection into an independent republic, and its annexa-



A CORNER OF THE PALACE OF LIBERAL ARTS

THE PALACE OF ELECTRICITY

A PORTAL OF THE PALACE OF EDUCATION

Architects, Eames & Young, St. Louis. The colonnades of this building are a notable feature

tion to the United States in 1845. This precipitated the war of 1846–48 with Mexico, by which, through conquest and purchase, we gained California and New Mexico (the present States of California, Nevada, Utah, parts of Wyoming, and Colorado, Arizona north of the Gila River, and part of New Mexico).

Meanwhile, from the Louisiana province as a base, Americans had been for years moving into the valleys of the Columbia and Willamette. Thus, the territory comprised in the present States of Oregon, Washington, and Idaho, and parts of Montana and Wyoming, became ours by the Anglo-American treaty of 1846. In less than half a century, the expansion impulse generated by the Jefferson-Bonaparte annexation sent the nation's boundaries from the Natchez parallel to the Gulf of Mexico and from the Mississippi to the Pacific; our territory was rounded out to continental proportions, with a sea-line on its east, south, and west boundaries; and the 827,000 square miles prior to April 30, 1803, were increased to 3,000,000 square miles.

Impressed by our expansion across the continent, and seeing that the whole of North America, including Canada, was likely to become ours ultimately, Russia, in 1867, sold us Alaska for $7,200,000, and 600,000 more square miles of territory were added to the national domain. Hawaii, already Americanized by the westward sweep of our influence, was annexed in 1898. In the same year, as a result of the war with Spain, we gained Porto Rico, the Philippines, and the island of Guam, liberated Cuba, and established a protectorate over it, became an Asiatic, as well as an American power, and gained the dominance in the Caribbean, which has been strengthened in 1904 by the treaty with the republic of Panama by which we are to build a canal for the benefit of the world across that isthmus, and by which we control absolutely a ten-mile strip through which the canal will run from the Atlantic to the Pacific.

All of those were among the Louisiana annexation's physical influences. Here are some of its social consequences: By giving the United States control of the Mississippi throughout its entire length, it prevented the threatened secession by Kentucky and Tennessee from the East, and by creating the great West with its nationalizing ideas it established the bond which held the Union together when the South attempted to separate from the North in 1861. At the same time, it started the blaze of revolution which swept from the Rio Grande to Cape Horn and around to the Gulf of California. All that continent broke away from Spain (Brazil also seceding from Portugal), and erected itself into republics, which the United States recognized in 1822, the empire of Brazil becoming a republic in 1889. To guard the new republics, Monroe, in 1823, issued his hands-off warning, which stopped the threatened raid on them by the Holy Alliance (Russia, Prussia, Austria, and France)—the mandate which Louis Napoleon obeyed when, in 1866, Seward ordered him out of Mexico, which Cleveland constrained England to recognize in the Venezuelan controversy of 1896, which was practically accepted by The Hague conference in 1889, and which received final international sanction when President Roosevelt called a halt on Germany, England, and Italy in the Venezuelan demonstration of 1903, and got the case submitted to the Hague Tribunal.

The province bought by Jefferson holds the geographical center of the continental portion of the United States; it contains, in 1904, 18,000,000 of the country's 80,000,000 of people; and it produces an annual average of more than half the country's wheat, nearly half of its corn, and more than 45 per cent. of its food-products in the aggregate. One of its dozen States (Missouri) has more population in 1904 than the whole United States had when Washington was first inaugurated President. One of its cities (St. Louis) has more residents than New York, Philadelphia, Boston, Baltimore, and all the rest of the country's cities had at the time of the annexation. The manufactures of one of its cities (St. Louis), in a single year, would pay Jefferson's $15,000,000 price for the entire Louisiana territory more than fifteen times over. The 1803 purchase was the most profitable real estate transaction in the world's history.

The Exposition illustrates the national expansion of which the great event that it commemorates was the first step. Such a vast expenditure of time, talent, and money are represented in it that the St. Louis Fair will probably remain for decades, if not forever, the biggest exposition that the world has seen.

A NEW EPOCH IN THE USE OF POWER

THE FAIR A PICTURE OF MODERN INDUSTRY—A LONG STRIDE SINCE THE CHICAGO EXPOSITION IN METHODS OF PRODUCING ELECTRICITY—THE TURBINE AND THE PRODUCER GAS-ENGINE HERALD A REVOLUTION—A FULL TEST OF THEM AT THE FAIR—HOW MACHINERY HAS REPLACED HUMAN LABOR

BY

BERNARD MEIKLEJOHN

THE Fair tells the whole tremendous story of modern industry. The power born in the boiler-house sweeps from place to place and from building to building in a gigantic wave of energy. Six times as much power is lavished to run the Cascades as was used in the whole Centennial Exposition. A trolley-car system is maintained. At night, the Fair is made a blaze of brilliancy equaling 6,660,000 candles. Yet enough is left from the 50,000 horse-power total to maintain the steam and gas and electrical machines which exhibit in the Palace of Machinery the first great steps in industry; to drive other machines which make still other machines; to keep in motion conveyers, drills, presses, motors, and all the automatic manufacturing marvels of an industrial age. The arrangement is as simple as the alphabet. One may start at the boiler-house and learn, by proceeding step by step through the Palace of Machinery, through the Palace of Electricity, and then to the other buildings, where the final processes are in view, how any article of modern use is brought from raw material in field or mine to fit the needs of man. All along the path are marvelous machines. Human labor is at a discount; human ingenuity is supreme.

Yet the meaning of the power and machinery exhibit is not in this full picture. The machines you see are not all the machines of yesterday, nor even the machines of today. The large fact of the Fair is, that many are the machines of tomorrow—machines undeveloped when the Chicago Fair was held, machines that the Pan-American did not show, machines that are destined to work a revolution in industry. For just inside the door of the boiler-house, to left and right, are mysterious-looking gas-producers erected to furnish gas for engines in the Palace of Machinery. In some measure, these are boilers of the future. And a few steps inside the Palace of Machinery are turbine engines, ranged beside the steam-engines of the present. These, in a measure, are the steam-engines of tomorrow. And as the function of the turbines is mainly to turn electrical generators, the electrical generator of tomorrow is before you—as different from the electrical generators of the Chicago Fair as the pneumatic-tired racing bicycle is unlike the clumsy velocipede of the 70's.

At St. Louis, then, the layman can fall into step with the engineer in learning how the industrial establishments of the future must be built and equipped. For the power and machinery display at the Fair is no mere exhibit, but a contest. Fuels will be tested later on for their merits as steam- and gas-producers; types of boilers will be compared; the gas-engines must prove their efficiency; the turbines must "find themselves." Day after day the fires in the boiler-house will consume their 500 tons of coal; day after day the engines and machines will perform the work they would be called on to do in actual practice; and, as the exhibition draws to a close, the mechanical installations will stand there, judged by their actual performances.

The main part of the boiler-house is given over to colossal batteries of boilers. Cars run directly from Missouri coal-mines and dump daily 500 tons of coal into bins, whence automatic conveyors and stokers feed it to the fires. Soot and ashes and human labor are lacking. The conveyors glide about among the rafters, the coal pours down to the automatic stokers, the automatic stokers carry it into the fire-boxes, and drop the resulting ashes into a pit beneath the floor. The steam made is piped from the boilers underground to the Palace of Machinery.

Its chief work here is to turn electrical

generators. As you enter the lower end of the building, the turreted bulk of engine after engine confronts you on the left—compound, triple, and even quadruple expansion steam-engines. But in front are the towering generators—run by the steam from the boiler-house—which produce the electricity for the Fair. Beyond, an array of machines extends itself to the other end of the building. Here and there a generator looms above the metal masses, and, high above, an electric crane sweeps back and forth. A spout of fire shows, over there, where a carborundum sharpening machine is shooting a stream of sparks from a drill. There is a glint of water; a hot-air engine is pumping. An automatic conveyer is rattling away with a train of boxes. The big Krupp press—the only important exhibit of the great German iron firm—is slowly squeezing down, with its pressure of 90,000 pounds. And everywhere are the whirring of wheels and the buzz and hum of generators big and little, for the power of today is electrical power, and the type of primary machine is more than ever the generator.

Now, big as the biggest generators are at the Fair, they are not colossal. They cover less ground by two-thirds than the generators at Chicago in 1893. And the turbine generators hardly take the eye at all. Here, indeed, is the great step in advance. Ten years ago, a vast engine was set up in which the steam drove a piston back and forth, the piston drove a crank which turned a flywheel on a shaft, and a belt led from the shaft to the shaft of an electric generator some distance away. The generators are smaller at St. Louis because now the generator has been made a part of the engine. The wheel of the generator has been put on the shaft with the flywheel. And a longer step still is made by the turbine. In this, the piston has been utterly removed. The steam is led directly to expand against blades or buckets set around a shaft—to make the principle very simple—so that the resulting motion is like that a small boy gets when he blows against a paper windmill. The wheel of the generator is placed on the same shaft which the steam—beating farther along against the blades—whirls so merrily; and the whole machine is about one-fifth as large as the present-day generator, yet with equal power. Here, then, is a machine which is just as efficient as the generators employed at Chicago, and about one-fifteenth as large. There never was a greater simplification in "prime-moving" machines. Yet the gas-engine presses the turbine hard as a comparative novelty, and it, too, is a simplification. Where the turbine eliminated the piston, the gas-engine eliminates the boiler. Coal is burned not to heat water for steam, but to give off gas; and the gas is burned directly in the cylinders of an engine—the piston shooting back and forth with successive explosive combustions of gas. The gas-engine and the turbine, exhibited now for the first time as fit machines for large installations, herald a new epoch in the use of power.

But the ordinary reciprocating engines first. At the Centennial Exposition, the steam-pressure that drove the Fair reached but sixty pounds. At Chicago, it reached 100. At St. Louis, it comes to the Palace of Machinery at 150 pounds, at 225 pounds, and even as high as 300 pounds. The most distinctive French exhibit, outside of the automobiles, is a remarkable steam-engine at the very door of the Palace of Machinery, which produces 1,500 horse-power by speeding at the rate of 330 revolutions a minute. It does this by using the 300-pound steam at 200 degrees of superheat. A wonderful engine to see, all knobby as it is; with its six cylinders, it is a triumph of engineering success in what it does. Most engineers have never seen anything like it. Then there is a towered reciprocating-engine generator, which provides electricity to run the trolley-cars on the Intramural Railroad. Nearer the door is the row of four generators, whirring away to provide, under contract, the power for the Fair's activities. Looking through the white plaster model of an armature of one of the great 15,000 horse-power Niagara Falls generators, one sees in the middle of the building a lofty and beautifully silvered engine whose electricity sets every bulb at the Fair alight every evening. These generators are not the largest made, but they show the high-water mark up to date in reciprocating engines. These are of the sort that now set in motion the mills and street-railways of the country.

It is but a step from these to the new creations. Off to one side of four big generators is a machine that looks like a short section of cast-iron water-pipe, with sundry knobs and attachments, and a small electric generator at one end. This is the Parsons turbine,

already a success on steamboats, and now built for use on land. Simple? A cock is turned which admits a jet of steam at one end of the cast-iron water-pipe. As the steam rushes through the pipe, or jacket, it pushes against the blades set spirally around a shaft within, which fits the jacket very snugly. Under the impact of the steam, that bladed shaft begins to whirl till its speed is 3,300 revolutions a minute. And, as the wheel of the generator is on the end of the shaft, it sings a song that is like a continued high-pitched siren note. One knows the steady chug-chug of the reciprocating engine. This little 1,500 horse-power turbine makes so little disturbance that one cannot tell whether it is in motion or not except for the note of the generator.

Out beyond the plaster model of the Niagara Falls armature is another turbine generator, or turbo-generator. This is set up vertically. It looks like a little green-painted turret, with a railing around the top, or as much as anything like an ordinary domestic furnace. Its appearance is mysterious, for the ordinary observer has never before seen anything resembling it. The top part is a drum in which the generator revolves horizontally. The lower part is a drum containing the turbine. This is the Curtis machine —an American invention.

Within the drum of the turbine proper are horizontal wheels with buckets in them. The axle of the wheels is the shaft of the generator. The arrangement is just as if the boy with the windmill had set a series of paper wheels on his stick. The steam enters at the top of the drum, and, expanding, strikes vertically the buckets in the first horizontal wheel, making it revolve. It passes then through buckets in a stationary wheel, which rests between the top revolving wheel and the one below, and strikes the buckets of the second movable wheel already revolving because attached to the same shaft as the top wheel. Then it goes through another stationary wheel, and then through the buckets of another movable wheel on the central shaft. Thence it emerges into a condenser, which is simply a vacuum box beneath, which, to speak colloquially, sucks out the steam. The whole process may be clearer if one bears in mind that a windmill is set revolving by a current of air blown directly against the flat side of the bladed wheel. This turbine is somewhat as if a windmill were set horizontally in a box, and steam blew directly down on it, passed through the blades, blew on another windmill, passed through the blades, and then blew on another windmill. The stationary windmills set between the layers of movable windmills are placed there so that the steam may have a chance to expand after passing each wheel—for the buckets, or spaces between the blades, open out in a flare from top to bottom.

There are other turbines at the Fair, but these will suffice as types. Their great advantage is economy of space; they take up but about one-fifth of the room of an ordinary engine. As their use develops, they will be installed more cheaply, though they can now be laid down at four-fifths the cost of the older engine. With no disturbance, no jarring or shaking, they maintain a uniform motion. They are capable of very high speeds—indeed, the problem of producing a commercial turbine has been to slow down the motion, for a turbine can be made to go at a higher speed than materials can bear without flying into pieces. Some have already been installed, and the companies that make them already have orders for them from every part of the world.

Their chief use is in producing electricity. Their development came about through the gradual drawing together of electrical and steam engineering. Power for varied uses must be electrical, yet the electricity must be made by steam-engines. A decade has seen the generator move into a place on the steam-engine; and now a new development of the steam-engine has arisen just to fit a generator, so that the two now form snug parts of a single compact, noiseless machine. So smoothly does such a machine now work that a silver dollar may be stood on edge on any part of it without falling over, though the engine speed to its maximum.

The gas-engine is the other novelty of the machinery exhibit. Gas or gasolene engines have long been used. Gasolene boats and automobiles are the commonest of sights. And there is a farm in North Dakota where three five-gang plows run by gasolene are handled by only two men. One man stands at one end of the field and one at the other. The plows are started, and the men await them as they successively reach the edge of the field. As each plow arrives, the man awaiting turns it, and then waits for the next. So

gas-engines of many types are naturally shown at the Fair. It is the producer gas-plant and the engine run by it that attract attention.

Ranged in front of the boilers in the boiler-house are two producer gas-plants—one red, one green. In each, a great fire of coal is made, and the stoker keeps on feeding coal as the fires of a boiler would be fed. The coal is made to burn slowly, to give off the maximum of gas. From one of these producers the gas, after going through cleansings, is led to a reservoir—the familiar gas-tank. Thence it is fed, as needed, through an underground pipe to the engines in the Palace of Machinery. From the other, the gas is fed directly to the engine without the intervention of a tank—the fires being regulated to produce the gas as fast as needed. In the engines the gas is burned by explosions in the cylinder. As the piston is drawn to one end of the cylinder, gas is admitted to a connecting chamber directly in front of it. When the piston has gone as far as it will go, an electrical connection is formed within the gas-chamber, creating a spark which explodes the gas. The explosion drives the piston to the other end, where the same operation is repeated. The method is not unfamiliar. The significance of the installations of producer gas-plants is this: Wood, poor kinds of coal, and even the refuse of cities may be used as fuel in the gas-producer, so that power may be created at very low cost. As gas-engines are being made larger and stronger than ever before, they can now be put to work in factories. Accordingly, the producer gas-engine promises a new economical source of power for industry. Tests will be made at the Fair to discover just how much cheaper it is to burn coal for gas instead of burning it for steam, and just how efficient the gas-engine is as compared with the steam-engine.

And now pass beyond the zone of engines in the Palace of Machinery. Never before has been gathered such a collection of machines which show that the labor of man has been replaced by the activities of things of iron and steel.

That steel crane overhead is a type of the machine that moves material and product in every large mill in the country. Over in a corner is a conveyer unlike the pocketed coal conveyer in the boiler-house, and unlike the conveyer which carries boxes and barrels up and down, and along and around corners. It carries coal and grain and other small objects in every possible direction on an endless V-shaped canvas band. One man can throw it into ceaseless operation by turning a switch, as the man perched up in the crane transports great iron beams about by simply moving a lever. Examples of machines are shown, either here in the Palace of Machinery, in the Palace of Mines, or in the Mining Gulch, which shovel iron out of the ground in the Michigan iron-mines, which cut coal in the Illinois soft-coal mines, which drill rock—one drill, for example, that bores its way into granite as an auger eats into wood. One firm shows a new dredging-shovel, which unloads ore-barges by taking up a ton at a bite; and this same firm builds machinery for handling coal or ore from vessel or train to storage pile, and back again, with no help from Liliputian shovels. Vessels can even be coaled at sea from a collier a quarter of a mile away by an automatic conveyer that glides back and forth across the water. In the Mining Gulch is a full-sized aërial tramway, such as those which carry ore through the air across Utah valleys. Another kind of conveyer, like a moving car, shoots loads of iron up slanting tracks to the top of Bessemer furnaces, and dumps it automatically. Men carry things no longer. Machines do the work. At St. Louis, one can see how they do it.

When materials are carried to their proper destination, they are wrought by machines into products. In the middle of the Palace of Machinery is a fully equipped machine-shop, which uses the power from the generators to run huge machines which make parts of other machines for manufacturing purposes or turn out products themselves. Here are drills and planes and lathes which cut steel like wood. Screw, nut, and bolt machines are busily at work automatically feeding themselves with bits of iron, and dropping out the finished articles in steady succession. A machine from Germany is holding a drill against a carborundum wheel at just the right angle and pressure to give the drill the finest point. Wood-working machines are exhibited. Barrel-making machines are setting up staves and hooping and finishing barrels. A box-nailing machine is nailing boxes, driving six nails at a stroke. And as one follows the currents of power from the generators out through the other buildings, one sees the whole field of electrical activities in the Palace of Electricity,

sees the processes of mining in the Palace of Mines, and watches the automatic processes in other buildings by which materials are handled without manual labor, and shoes, hats, clothes, and furniture manufactured, foods prepared, books printed—in short, all industry which twenty years ago was carried on by men, now carried on by machines. It is one coherent story, which begins at the boiler-house, takes its big forward stride in the Palace of Machinery, and rounds itself out in a thousand processes.

The significant facts are: That electricity is the power of today and, to a vastly greater degree, of tomorrow; that the turbine, the gas-engine, and the automatic machinery show a swift advance toward cheapness, simplicity, cleanliness, noiselessness, and compactness in the units of power employed to do man's work in a preëminently mechanical age.

THE MARVELS OF AN ELECTRICAL AGE

THE MOST COMPREHENSIVE EXHIBIT OF ELECTRICAL ACTIVITIES EVER MADE—NOVEL MOTOR-DRIVEN AUTOMATIC MACHINES—A STREET-RAILWAY MOTOR OF TREMENDOUS POSSIBILITIES—STRANGE LIGHTS, RECORDING TELEPHONES, HIGH-SPEED TELEGRAPH TRANSMITTERS, NEW STORAGE BATTERIES—TELEGRAMS SENT FROM TYPEWRITER TO TYPEWRITER — ELECTRICITY PERFORMING INNUMERABLE WONDERFUL TASKS

AS you enter the Palace of Electricity you hear uncanny whirrings and snappings; you see electric lights of hues and intensities that you never saw before; strange machines begin to glide or whirr or glow or click. The meaning of all these things is that electricity is put to more varied uses, and that the machinery for its utilization is now snugger, lighter, simpler, and yet productive of more results, than ever before. Professor Thomson's lightning arrester, which catches and renders harmless an artificially created bolt, shot from a wire hung in mid-air to the arrester, with a crash of thunder and at the astounding speed of 1,000,000 volts; the automatic telephone exchange which connects wires without human aid; the automatic electric printing-press; the mechanical telegraph sender, which transmits messages forty times as fast as a human being; the row of motors, starting, running, and stopping in an endless succession by their own ingenious mechanism; the telephone that carries your words along a beam of light; the wireless telegraph, sputtering with its strangely caught message; the electric locomotive, moving to and fro—these and many other marvels show the many uses of electric power at work in its highest, latest applications.

The electricity used is produced by steam-driven generators. But in one corner of the building is a model of a new power-house which rests on the cliff at Niagara Falls; and, reared high at the edge of one of the most remarkable exhibits, is a full-sized model of the armature of a 10,000 horse-power generator, the largest in the world, built also for Niagara use. Indeed, some of the electrical machines are adapted, for commercial purposes, only to waterfall regions where the primary power is cheap. The main note of the Pan-American Fair, at Buffalo, was the use of electricity produced by the neighboring cataract—then 120,000 horse-power. At St. Louis, where the note is the note of steam-produced electricity, machines such as those displayed before you have so clearly proved their utility that they will now be used at Niagara to the total of 550,000 horse-power. That is a measure of the increase in the employment of electricity made by waterfalls. The spread of the coal-born electrical power has been fully as great.

How this power is produced is shown in the Palace of Machinery. Reaching the Palace of Electricity, the power performs the work for which it has been created. In transformers and in rotary converters, the voltage, or pressure, is reduced to fit the need of the lamps and the machines that the current is to serve. In the daring practice of California, where electricity is carried 300 miles, a pressure is reached as high as 80,000 volts; and on the trolley system which unites Indianapolis

with Muncie and Fort Wayne a voltage of 32,000 is in service for nearly one hundred miles. When such high-speed currents are required for lamps and motors, they are lowered to a voltage of about 110. Here many admirable types of transformers and converters are carrying out these necessary diminutions.

When the motors begin to whirr, the observer begins to see results. In the exhibit of a great electric company, one motor is large enough to print a metropolitan newspaper; another, of but one-eighth of a horse-power in its energy, is running a sewing machine. Others in the neighborhood are busy mixing dough, stirring candy, or creating breezes of constantly varied direction. Such motors are fast driving from factories the old-time belts and pulleys. When one machine is at work, the cost of energy is for only as much as that machine uses; there is no need to keep up steam enough to run a dozen machines, with long lines of shafting. A workshop rid of belts and pulleys is at once made safer, cleaner, and lighter.

A vast diversity of tools and machine-tools are shown organically united with electric motors—emery wheels, planers, drills, milling-machines, and so on. There is an electric controller promptly reversing a motor, such as might replace the steam-engine in a steel-rail mill. Meanwhile, above our heads an electric crane is picking up huge burdens and carrying them off as gently as if they were hens' eggs. Its simple mechanism, guided by a touch, is in full view.

Equally well exposed is the machinery of a trolley-car, whose base, raised, for the enlightenment of visitors, about ten feet above the floor, has its mechanism so laid bare that the layman can examine and understand clearly what has before been a mystery—the way a trolley-car is made to go. And not far away, in another exhibit, is a new motor of tremendous possibilities, to be given a full test at the Fair. So far, even on the new Subway line in New York city, it has been impossible to send along a street-railway system a current to be fed directly to the motors on the cars. The power-stations send out alternating currents, because a thin wire can transmit alternating currents over very long distances. The car motors use a direct current. It has been necessary on trolley lines to build sub-stations at great expense to convert the current from the main power-station from alternating to direct for the use of the cars. This new street-car motor will use the alternating current from the power-plant with no need of sub-station intervention. Its success—and the makers have tried it thoroughly—will mean a tremendous economy in street-railway operation. The summer's test of this and other new trolley mechanism in 60-mile runs on the Fair grounds is likely to solve some very important transportation problems. And it may be pointed out here, since the alternating current street-car motor is the type of advance—that, just as the introduction of electric motors makes a great saving in space and a diminution in wear and tear and loss as against steam-engines and belts, the electrical improvements are mainly in the same consistent direction of more snug and simple units of machinery, compact, clean, efficient, and silent.

Another forward step is the perfection of the electrical locomotive. There are two here of the latest type. The interests of steam and of electrical transportation are plainly getting together. Not so very long ago they looked askance at each other. A locomotive for mining service, making up in length for its slowness, is beside us. Not far away is a car traveling on a circular track, serving as a model of the monorail system for the projected railway to join Manchester and Liverpool. Trains are to run from city to city, 34½ miles, in twenty minutes—that is, at 103½ miles an hour. The road structure is a single rail borne on a stout triangular frame; the car overhangs this frame, and is secured against leaving its path by wheels which press sidewise against supporting metals. This railway will separate quick passenger traffic from ordinary passenger business, and from freight service. There will be no way stations; a novel feature will be a sharp down-grade at each terminal, to quicken departure and to retard arrival. The British Parliament has taken a deep interest in the line, and its builders are rapidly pushing it along. An interesting feature of its operation will be a highly developed signal-system, that will keep one full block of clear line between every two trains, for cars shooting onward at such high speed require a full half-mile to come to a stop.

Trolley-cars, in a mode familiar to everybody, are warmed in winter by electricity; a

current passing through a bad conductor is resisted and the medium becomes heated. Electric heat is much dearer than heat from fuel, yet in many cases its convenience and refinement make it preferable. The exhibit of its practical uses shows a diversity of smoothing and soldering irons for the laundry and workshop; griddles, broilers, toasters, and ovens for the kitchen; curling-tongs for the toilet-table; foot-warmers for the sick-room; with heaters for rooms whose air they do not vitiate.

Moreover, just as with every other spectacle shown at the Fair, electric cooking may be seen going on in practicable form. Those who have cards to use the restaurant at the New York State Building eat food prepared in electrical ranges, and, in the kitchen, one may see steaks broiled on both sides at once with marvellous celerity on an electrical broiler, roasts browned in an electrical oven, soups bubbling over heated electric wires. But only in districts where water-power makes electricity cheap could houses be heated and kitchens equipped with electrical apparatus as economically as when coal is used. Still, at a slight increase in cost for installation and maintenance, one could, in most well-settled communities, replace coal and gas ranges and furnaces with electric stoves and heaters that would keep a house warm and prepare food with a cleanliness, a despatch, and a convenience unknown outside of the few New York hotels which already cook by electricity.

Temperatures incomparably higher than those produced for household uses are easily attained in the electric furnace. One of its latest products, shown at one exhibit, is alundum, used as an abrasive. It is an artificial corundum, or, to speak chemically, an aluminum oxide. One may also see how graphite is made from anthracite coal in an electric furnace. Gas is used in the exhibit instead of electricity, but the process is, nevertheless, clearly presented.

The mode of making incandescent lamps from first to last shows that striking improvements have been made since 1901. The process is so much improved on the original practice that prices are today but one-fifth, or so, of those charged at first. In lighting large spaces at the Fair, inclosed arc-lamps are employed; these are today the cheapest source of electric illumination, but this statement may be obsolete tomorrow. The General Electric Company shows a Steinmetz mercury-vapor lamp, self-starting, which gives a cheaper light than an arc lamp, but of greenish color. This disadvantage is measurably corrected in another lamp by uniting a vapor lamp with an arc lamp, but the color of the resulting illumination is pinkish and not quite pleasing. The arc lamp, however, is soon to face a rival on its own ground. Professor Steinmetz has devised a lamp which burns magnetite sticks, pouring forth a beam which may displace the familiar carbon pencils. It throws its beams horizontally better than the arc light and is whiter in color. The only commercial installation of such lamps so far is in Newton, Massachusetts. Visitors to the Fair examine the specimen magnetite lamp with curious interest, but they are as much pleased with the common arc lamps burning within a red globe, so that one may watch the curious combustion of the ends of the pencils—where a powerful miniature sun is formed.

In lighting a street, a furniture factory, or a lumber mill, the hue of a beam matters little; but this is not so in factories, stores or houses where dyed fabrics are woven, sold or worn. An ingenious instrument, also exhibited by the General Electric Company, the lumichromoscope, takes rays from four distinct sources, illuminating a piece of tartan. The tartan rests within a tube. It is first examined in daylight; then, one after another, different kinds of lights are thrown upon it—an arc light, an incandescent light, a mercury vapor light, and so on. The images differ startlingly. One light alone shows the cloth just as it appears in the daylight. This is an arc-light with a concentric diffuser made of glass and having an opalescent glass shade. This form of lamp is now in use in stores where cloth goods are matched and bought. The mercury-vapor lamp, however, is a boon to photographers. But, for ordinary purposes, the display at the Fair indicates that the familiar arc and incandescent lights are still the best, though one may see a form of prismatic globe which admirably softens and diffuses the rays of the incandescent light. It is exhibited in a well-furnished room, where the effect of the illumination on ordinary surroundings is made apparent. A soft, luxurious light exposes every crevice of the room, with an utter absence of glare.

At an extreme, a telegraph operator of the quickest touch can send about fifty words a minute over a wire; an ordinary operator has but one-third this pace. A wire can carry distinctly the signals for 1,000 to 2,500 words a minute. Why, then, limit transmission to a mere fraction of this rate? Mr. P. B. Delaney, of South Orange, N. J., answers this question with an apparatus of striking ingenuity. An operator manipulating a Morse key reduces a message to perforations on a tape. This tape is then run between a pair of metallic springs, arriving as Morse characters on a paper strip soaked with a compound which changes color under each electric pulse. Between cities 1,000 miles apart, as Chicago and New York, this system transmits 1,000 words a minute; between New York and Philadelphia, say, 100 miles from each other, a speed of 2,500 words a minute is feasible. Mr. Delaney suggests that this rapid telegraphy be allied with the post-office, so that a telegram of 50 to 100 words sent from St. Louis to New York could be delivered within an hour or two, and at a rate so low as to place telegraphy for the first time at the service of all the people.

There is probably no commercial machine which works so far below its possibilities as the telegraph. It is true that messages are sent over the same wire in both directions at the same time; and, on one line between New York and Philadelphia, the wire is used simultaneously for telephoning also. But normally a wire is not taking one-fiftieth of what it might take. And here is one of the advantages of the electrical transmitter; it could keep the wires used to their maximum. Important business mail, in which the time of transmission is of very great moment, might be sent by telegraph. A typewriter operator could write out the tapes by simply manipulating a keyboard. The tapes could be rolled and sent to the telegraph office. The tapes emerging at the other end could be rolled—automatically—and sent to the person addressed, whose typewriter operator could write out the letters from the tape fed automatically across the top of her machine. This system would have all the secrecy of mail, and a wonderful saving of time.

But telegrams are nowadays sent with no wires at all. The DeForest wireless telegraph has two stations in the Palace of Electricity sending messages to each other, and on the grounds it has a signal-tower 300 feet high. DeForest messages have been sent 600 miles at sea, and are now bearing Russo-Japanese war news to the London *Times* and the New York *Times*. Land messages have been transmitted sixty-four miles, skilful attuning keeping the signal free from interference by foreign wireless messages originating but five miles off. The DeForest receiver embodies an electrolytic principle, the signals increasing the resistance of the local circuit of the receiver. This increase of resistance makes itself heard as a sharp crackling sound in a telephone. The Marconi receiver, exhibited in several forms, is constructed on a different principle, employing a tiny tube filled with a pinch of metallic filings which cohere as signal waves impinge upon them; it is the detection of lessened resistance from moment to moment which reveals the message. A DeForest automobile, with a pole to catch signals, is exhibited as used by the United States Government. A wireless telephone, operated all day long, is one of the attractions of this marvelous Palace of Electricity. Now that wireless telegraphy has reached the point where an ocean steamer can keep in communication with land all the way across the Atlantic, it has vindicated itself as a commercial acquisition to human facilities.

A short distance apart in the Palace of Electricity are the wireless receivers and a display of cables and cable instruments. It was but forty-five years ago that the first cable was laid across the Atlantic. So soon as this, an immeasurably less expensive means of communication has been carried to successful operation. And here, as in several other electrical exhibits at the Fair, is a startling fact symbolized—it is brought home to one hard—that electrical advance takes marvelously long strides from decade to decade, longer than have been taken in any other human effort at control over matter.

RURAL AND AUTOMATIC TELEPHONY

The display of telephone operations, beginning with an historical representation of the changes in telephone instruments and running to the contemporary telephone exchange with the girls at work, and thence to the automatic exchange, to the telephone receiver that is receiver and transmitter in one—comfortably held in one hand, with the box at a distance—and to the telephone that records

messages in one's absence, has large facts for background. We use the telephone more than all Europe—thickly settled as it is—and Canada. There is a suggestion of diffused prosperity and of keen business activity in such a fact as that. Only one-fifth as many telephone calls were made as letters were sent in the year of the Chicago Fair; last year, despite the vast increase in mail, there were two-fifths as many. Even since the Buffalo Fair, the mileage of telephones in the United States has tripled.

Within the past five years throughout the Union, a good many rural telephone lines have been built, uniting groups of farmers with one another and with the nearest country towns. Such of these as run along wire fences are untrustworthy in wet weather, and are at all times liable to provoking accidents. The best plan is to do what city folk do—build a line with solid posts, stout wire, and modern instruments. A progressive Chicago supply-house installs such plants as part of their business. They are emphatic as to the desirability of substantial construction, which proves cheapest in the end. Telegraph and telephone interests, once bitterly at war, have now measurably composed their differences. This is mainly due to the devices which send telegrams and telephone messages over a wire at the same time without confusion. The lines for long distance telephony are of copper, and in this and every other detail are the best conductors in the field of communication; they are leased systematically for certain hours daily by leading firms as their private telegraph lines.

A remarkable development in recent telephony is that of automatic instruments, which dispense with the ordinary manual-board so as greatly to reduce the staff required for operation. One of the electric companies of Chicago exhibits complete outfits, such as it has installed in a chain of twenty-five cities, Chicago heading the list with an exchange of 10,000 instruments.

SOUND CONVEYED BY LIGHT

Shortly after he perfected the telephone, Professor A. Graham Bell devised the radiophone, which commits a vocal message to a beam of light. This apparatus is here delighting hundreds of hearers every day. Its feats of natural magic turn on the singular property of selenium by which variations in a beam of light cast upon the metalloid cause corresponding variations in its electrical resistance. One speaks or sings at a mirror which throws an intense beam of light to a distant mirror, in which a selenium focus is united to a telephonic receiver. In the present case, but a hundred yards or so divide the mirrors; they have worked with equal success twenty miles apart. This weird invention may yet prove an important resource in war, should other means of communication break down.

Its performances duly enjoyed, we pass to the Bell historical display, in which appear the first crude telephones, with their successors, down to the instrument which bears the voice from Boston to Omaha, and may any day carry one's words beneath the surging Atlantic. Yet the story of the telephone is a story of but thirty years.

WRITING TRANSMITTED

Here, for a few minutes, we pay a visit to the United States Government Building, where we examine two remarkable instruments. The first is the telautograph of the late Professor Elisha Gray, of Chicago, which at any distance exactly reproduces one's handwriting or drawing as executed with a pen or pencil electrically connected. Close by is the Poulsen telegraphone, which records, by varying degrees of magnetization on a moving steel wire, the message from a telephone. At any time afterward, this wire may be run through a telephone, repeating its message with a clearness thus far denied to the phonograph. This invention, recording, as it does, messages received during one's absence, opens a new breadth to telephonic utilities, and is plainly fraught with great value in news service, where a single operator may communicate with scores of newspaper offices widely separated. And in all its applications this device gives telephony what it has hitherto lacked—a record which shall be as satisfactory as the written message of the telegraph. A noteworthy fact is that the impressed wire, but one one-hundredth of an inch in thickness, may be tightly coiled like thread on a spool, without the least confusion of the delicate and varying magnetization of the metal. A momentary application of a strong magnet to the wire utterly banishes all impressions, so that the wire is serviceable again.

Thus within the scope of the Fair, visible

in action, are the elements of a system of telephony whereby a man may call up his own office from a distance, making his own connections, and then proceed to his office, take down his own telephone transmitter, and listen to his own message. All the intervening stages between voice and ear have been taken by modern electrical machines.

STORAGE BATTERIES

Returning to the Palace of Electricity, we go to the Edison exhibit, of fascinating interest. Here are Edison's first electric locomotive and car, a gimcrack affair and yet the parent of the elaborate equipments of today. Beside us is his first dynamo, which had probably about one-half the efficiency of modern machines—a creation of 1881 and already antiquated. Then follow case after case filled with his early lamps, fixtures, and meters, long since radically improved so as to seem quite old-fashioned. In the workshop of this inventor, one of the greatest of all time, so rapid is progress that a single generation suffices to bring a masterpiece of skill to the museum shelf.

One of the recent inventions of Mr. Edison is his steel-nickel storage-battery, specially designed for automobiles. As here shown, it weighs but sixty-five pounds for each horse-power exerted one hour. Such a battery, with its freedom from heat and odors, its safety and ease in management, is preferable, as a motive power, to gasolene or steam, especially in crowded cities.

Much has been expected of this battery. Brought into commercial use, its practical meaning is this: A pleasure automobile can be equipped with a motive power, the mechanism weighing but 500 pounds, which will drive the machine at touring speed—one automobile with the Edison battery went from Boston to New York in forty-eight hours, including all stops—for sixty miles without recharging. The cost of recharging at power-stations will run from about five cents a horse-power to eighteen cents a horse-power, according to the expense of producing electricity in different neighborhoods. For spurts, high speed can be maintained. The mechanism will not wear out easily. In the tests of the battery, one man spent day after day driving an automobile over cobblestones until he had made 4,000 miles. The plates in the batteries were more efficient than when he started. Further, in keeping the cells filled with fluid, the automobile owner does not have to put in potash; he simply adds a little distilled water. Indeed, a child could run and care for such an automobile.

So far, however, the chief use of storage-batteries has been in cabs and in motor trucks, for lighting purposes, and for street-railway power-houses. Of quite other pattern than the Edison battery is the "chloride accumulator" of the Electric Storage Battery Company, of Philadelphia, here exhibited in a model house of fifty-four cells charged with energy equal to 22 horse-power exerted for an hour. This group of cells might well serve to light a country villa. Installations on a large scale are employed in office-buildings and in central power-stations to supplement an ordinary current during the rush hours of business. In St. Louis, the local traction system uses a storage-battery of this type which could exert 2,500 horse-power one hour.

In use, the storage battery for such a purpose acts like a huge automatic sponge that absorbs and discharges at need. A battery of many cells is attached to the power-house generator, and also to the railway system. When the cars are not using all the power the generator produces, the surplus flows into the storage-battery; when the generator is not supplying enough to run the rush-hour cars, the reserve supply in the storage-battery flows out over the wires. Ingenious electrical mechanism makes the change at just the right moment. At the Fair, one may see the many horse-power load of a bank of lights thrown suddenly on a battery. There is not even a tremor in the cells.

MEASUREMENT

Now that electricity is produced on a huge scale, it behooves the engineer to test his apparatus with the utmost nicety. For this purpose, if he would employ the most accurate and delicate instruments, he must, perforce, obtain those of the Weston Electrical Measuring Instrument Company, of Newark, here exhibited in full diversity. An ordinary portable instrument is guaranteed to be correct within one five-hundredth part of the truth. On special order, they are made and guaranteed to be correct within one one-thousandth. Using such an instrument, it is easy to detect the feeble current excited when two metals are warmed by the hand at their junc-

tion. By research as to alloys which vary hardly at all either in dimensions or electrical resistance through a pretty wide play of temperature, Mr. Weston has succeeded in giving his measures a new excellence.

During the Fair, the United States Bureau of Standards Laboratory will be in operation. This Bureau has charge of the standards of length, weight, volume, electrical pressure, and quantity, and so on. For a moderate fee, apparatus is officially tested by this Bureau.

FOREIGN EXHIBITS

But little space remains for a word about foreign exhibits. Those of Germany in the Palace of Electricity include displays of physical and chemical as well as electrical apparatus, all testifying to the thoroughness, the skill, and the philosophical insight that have given Germany the lead among nations in original research. Jena glass, without brittleness when suddenly cooled or heated, and opening new worlds in the telescope, the microscope, and the camera, is here exhibited. Great Britain and France are worthily represented, France showing the original Gramme machine, which marked an epoch in the conversion of mechanical power into electricity. Great Britain displays many excellent instruments, notably those from the University of Cambridge.

But it is the output by Japan that makes one pause the longest in this foreign department. The electricians of Japan have thoroughly learned how to design and construct dynamos, motors, telephones, and all their whole sisterhood of instruments. When decoration appears, it has the unmistakable Japanese stamp, reminding one of fans and screens from the Island Kingdom. In one point, the Japanese exhibitors teach a lesson: everything they show bears its price plainly marked.

Nor are these all the electrical wonders at the Fair—indeed, one could not catalogue them, for everywhere one goes, electricity is at work doing remarkable things. In the Palace of Electricity further marvels are manifold. One may see carborundum abrading-machines at work—the utilization of a product the first sale of which was at a rate of $450 a pound. It is now turned out of electrical furnaces by thousands of tons a year, and is cheap. A new transformer for charging automobiles is there which practically replaced elaborate machinery with a little glass tube in which a mercury vapor glows brightly as the current passes through it—another electrical simplification. To switch off an electrical current of high speed and power would mean proximity to lightning, for the breaking of contact means a "spark"—an appalling blue flash—that has been known to leap fifteen feet. You see here switches that slip slickly through oil-baths where the spark is smothered. There has been a widening application of electricity to the treatment of diseases. There are "fool-proof" things—electrical switches, for example, that will do no other than throw a current on by degrees, no matter how rashly an impulsive workman may wish to hurry the connection. You may see a regulator at work which keeps lights at a uniform brilliancy; it actually floats on a field of magnetism, and wavers up and down as the load on the generator varies with the switching of lights on and off. An electric mine locomotive runs along with no trolley; it trails behind a feed wire running out from a revolving reel, or winding up as the locomotive goes back and forth in the imaginary mine-chamber. A graphic recording ammeter, for testing the quantities of electricity used in different kinds of machinery, is already on exhibition—the first one of its kind ever made. It will probably be used in the electric railway tests. A set of meters shown at work will convince the citizen that his own electric meter does not lie.

The specific things that mean most to industry, however, are the electric locomotive, the alternating-current motor for street-railways, the automatic telephone and telegraph inventions, the wireless telegraphy installations, the improved storage batteries, and the generators and motors that show a marked advance in simplicity of construction since the Chicago Fair.

Europe is still a little ahead of us in manipulations of electricity for scientific purposes, and Germany and England in high-speed street-railway installation. But, in the other wider and more directly productive applications of electricity to industry, and to the uses of daily life—on a colossal scale—this exposition shows the United States preëminently foremost.

TRANSPORTATION AS A MEASURE OF PROGRESS

THE INTERESTING SPECTACLE, THE HISTORICAL STORY, AND THE SCIENTIFIC LESSONS OF THE EXHIBITS OF TRANSPORTATION — THE LARGEST LOCOMOTIVES IN THE WORLD — STEAMSHIP PROGRESS — AUTOMOBILES — "THE SPIRIT OF THE TWENTIETH CENTURY"

BY

ISAAC F. MARCOSSON

IN the centre of the Transportation Building, on a large turn-table, stands a locomotive weighing, with its tender, one hundred and sixty tons. Outlined against the white rafters of the huge building, it looks like a long steel racer; and, as it revolves slowly, its driving-wheels whirling, it is the very embodiment of "The Spirit of the Twentieth Century," as it is officially labeled. Radiating from it, on four miles of tracks and sixteen acres of floor-space, are exhibits that explain the whole evolution of transportation, from the most primitive mule-cart to the private palace-car.

HISTORIC ENGINES

The arrangement of the different machines of transportation into groups such as railway, steamship, and automobile mechanism makes it comparatively easy to get a comprehensive view of the whole display. The best way to see it is to begin with the railroad exhibit, the largest and most important, which occupies the centre of the building from end to end. Entering from the east, you first see the Baltimore & Ohio section, which includes the historic models from the Field Museum, telling the whole story of the development of the use of steam-power for transportation on rails.

The first crude idea of a high-pressure boiler is represented by a large kettle over a fire, mounted on wheels. This same idea, slightly improved with a beam attached to a wheel, stands alongside it. The original model of this was very small, and was the invention of William Murdock, in England, in 1723. Murdock operated the model on his kitchen floor.

The first engine to run on tracks is the model of one originally used on the tram-car railway at the Mythòr-Tydvale railway in England. The rails were laid on stone settings, and some of the original rails and supports are displayed. On this engine was a horizontal cylinder. The wheels on which the engine rests are nearly six feet in diameter.

George Stephenson, whose name is associated with the first successful achievements in locomotive construction, and whose statue may be seen in the middle of the exhibit, built an engine in 1812 with rough wheels and a cog track. A model of this is shown. The prevailing idea was that smooth wheels could not draw a load over a smooth track. In 1814, however, at the Wytan colliery in England, by means of a heavily loaded truck, the weight being equally distributed, it was proved that smooth wheels adhere easily to the track, and move loads more easily than rough wheels.

At the extreme northeast end of the historic exhibit stand models of the three engines that participated in the famous test from London to Manchester, England. These engines proved to England the efficiency of steam-power for transportation. The test was made by George Stephenson's "Rocket," Timothy Hackwerth's "Sans Pareil," and John Ericsson's "The Novelty." The "Rocket" made thirty miles an hour, and received the prize.

In America, however, before the London and Manchester tests, John Hedley had built an engine called "Puffing Billy" because of the puffing steam. It was made like a grasshopper, the legs of the steel insect moving the wheels of the truck. This model is one of

the most ungainly of the group. It remained, however, for Peter Cooper to build the first locomotive to draw a car in the United States. It was called "Tom Thumb," and it ran over the Baltimore & Ohio tracks from Baltimore to Ellicott City, a distance of thirteen miles, in one hour and twelve minutes. Thus began railroad travel in the United States. The famous "DeWitt Clinton" train, consisting of an engine and three passenger-cars, built like stage coaches and each carrying nine people inside and six outside, which is part of the New York Central & Hudson River Railroad exhibit, was operated for the first time in 1831. The original train, which ran seventeen miles an hour, is to be seen, and alongside is the "Empire State Express," representing the perfection of modern railway speed and comfort, which has attained a maximum speed of one hundred miles an hour.

Meanwhile, locomotives were taking a definite shape. By an accident, James discovered, in 1832, that he could cut off the supply of steam. A model of his engine shows a crude steam-valve. The first eight-wheel locomotive, built for the Baltimore & Ohio Railroad and weighing twenty-two tons, at that time the heaviest in the United States, is seen. The first engine built by Mr. Matthias W. Baldwin, founder of the Baldwin Locomotive Works, was "Old Ironsides," and it is part of the exhibit. It was first run in 1832. The weight of the locomotives gradually increased, until, at the Philadelphia Centennial Exposition, the Baltimore & Ohio showed an engine weighing fifty tons. This locomotive looks very small alongside the locomotive called the "Director General," weighing 100 tons, exhibited at Chicago. But the "Director General" is dwarfed by the monster Mallet-type Baltimore & Ohio freight locomotive, which weighs 233 tons, and which is the largest and heaviest locomotive ever built. It was especially constructed for heavy mountain grades in West Virginia. It towers above every engine about it, and looks like an iron citadel.

THE LOCOMOTIVES

Having followed the construction of the locomotive from the crude expression of high steam-pressure to the engine capable of hauling 100 loaded freight-cars, it is interesting to go on to the exhibits of the builders of locomotives. Fifteen years ago, 130 pounds of steam-pressure was the highest obtainable. At the St. Louis Fair there are twenty locomotives each capable of steam-pressure of 235 pounds. As the American locomotives have been built larger, so has the boiler capacity been increased, and, with an increased steam-power, the hauling power has been increased.

The locomotive builders are represented by twenty-six locomotives, the heaviest being the "Santa Fé," which, with tender, weighs 190 tons. It is the largest passenger locomotive in the building. There are two locomotives on raised tracks outside the building. One of them, owned by the Burlington road, hauled a train weighing 562 tons 202 miles in four hours and twelve minutes.

The principal locomotive of the American Locomotive Works is the one on the turntable. This is the joint exhibit of the builders and of the Big Four Railroad, the owners. The driving-wheels are run for exhibition purposes by a dynamo, which also moves the turn-table. The American Works display eight large locomotives of the latest patterns and construction. The Rogers Locomotive Works has three large locomotives.

THE TESTING-PLANT

As you pass between rows of silent locomotives, suddenly you hear the puffing of one under full steam, and you come upon a sight never before witnessed at any exposition. Mounted high in the air, with every wheel turning, with steam hissing from every escape-pipe, with black smoke rising from its stack, and with coal burning under the boilers, is a freight locomotive. An engineer sits in the cab at the throttle, and a fireman shovels coal into the box. The engine quivers and pants, yet does not move an inch forward. Men crawl over it and under it. It is a locomotive being tested at the testing-plant, which is the principal feature of the Pennsylvania Railroad Company's exhibit.

The plant is not a spectacular show only, but a mechanical laboratory. Its work is of permanent value to locomotive construction. For twenty years, American locomotives have been increasing in weight and power every year. But the increase was largely external. The refinement of mechanism was not analyzed. The economic value of the engine had not been studied. Seven years ago, Mr. Willard Smith, of Chicago, the owner of *Railway*

and Engineering Review, and a student of all kinds of railway transportation, and now Chief of the Department of Transportation exhibits at the St. Louis Fair, conceived the idea of a laboratory to find out, first, how much work a locomotive can do, and, at the same time, to test all the mechanism. He wished to establish a science of locomotive investigation. A small plant of this kind was in operation at Purdue University at Lafayette, Indiana, but working locomotives could not be tested there.

Mr. Smith tried to secure an endowment for such a large plant from wealthy railroad men. They approved the plan, but declined to support it. When the Pennsylvania Railroad asked Mr. Smith to suggest an exhibit at St. Louis which would be not only original, but useful, he suggested the locomotive testing plant, with the understanding that engines of many roads should be tested. The suggestion was adopted, and a laboratory was built at a cost of $250,000. The tests are made under the joint auspices of the Exposition, the Pennsylvania Railroad, the American Society of Mechanical Engineers, and the American Railway Master Mechanics' Association. The report of the results obtained will be submitted to the associations as part of their mechanical research.

The driving-wheels of the locomotive being tested run on smaller supporting wheels, whose axles are connected with absorption brakes operated by high water-pressure. The engine is attached to a draw-bar, which, in turn is attached to a traction dynamometer. This dynamometer is imbedded in a solid concrete foundation. Instead of pulling a train, the locomotive pulls at the draw-bar. When the locomotive is fired up, and the throttle opened, its driving-wheels begin to revolve. They turn the smaller supporting wheels, whose resistance may be increased by the absorption brake. The more power that is turned on the supporting wheels, the greater the work required from the locomotive to overcome the frictional resistance. The measure of this work—the work done by the locomotive—is made on the traction dynamometer, and is reduced to foot-pounds. By means of delicate apparatus, the amount of pull exerted at the draw-bar is automatically recorded on rolls of paper.

But the amount of work done by the engine is not the only result obtained. Economy in coal and water is proved. The water used in the boilers is chemically treated, measured, and purified; the coal is cleaned and weighed.

By means of calorimeters attached to the engine, the amount of energy produced from the coal and absorbed by the water is accurately measured. Everything is, therefore, scientifically recorded.

The ideal conditions which govern these tests make it possible for all kinds of locomotives to be tested in the same way—measured by the same standard. Heretofore, the practical tests of locomotives were track tests, where the conditions varied with every test. During the Exposition, American, German, and French engines will be tested.

THE HUDSON RIVER TUNNEL

Just east of the testing-plant is a section of the Hudson River tunnel, at New York City, to be built by the Pennsylvania Railroad. The section shown will be part of the tunnel. It is 21 feet in diameter, and is composed of eleven pieces of iron, each one weighing 60,000 pounds. There will be two tunnels, one for east-bound and one for west-bound trains. The total cost of its construction will be $25,000,000, and five years will be required to build it. Near this tunnel section is a large model of the Pennsylvania station in New York, which will be connected with the tunnel. There is also a large cross-section of the City of New York, showing the proposed subway connection, which will enable a man to travel on the same car from Washington to Long Island City without change. To reach his destination, he will pass under the Hudson River, under New York city, and under East River. Now it is necessary to make three changes. The river trips are made at present by ferry.

ELECTRIC LOCOMOTIVES

Electric locomotives will haul the trains through the Hudson River tunnel. Ten years ago the only electric locomotives in use were run for hauling ore-cars in mines and small tramway-cars in the yards of steel-rail mills. Today the Baltimore & Ohio Railroad is using electric locomotives weighing 165 tons to haul trains through the Montclair tunnel, near Baltimore. These engines go as fast as steam locomotives, and they are safer and cleaner for long tunnels. They produce no gases, which sometimes cause explosions.

A little while ago, the New York Central & Hudson River Railroad ordered thirty electric locomotives for use in New York. These will be attached to the trains just before the city is reached. In the long tunnels in the hot season passengers may sit with their windows open without fear of soot and cinders.

In hundreds of mines in America, England, France, and even far-away Japan, the electric locomotive is in use, pulling the ore-cars where formerly patient mules pulled them. In the large yards of rail- and steel-mills electric locomotives move heavily laden cars, doing work formerly done by small steam locomotives. All these large mills have their own electric power-plants. They have found it cheaper to use the electricity for motive-power.

What, then, is the significance of the wide and constantly growing use of the electric locomotive? Simply this: Wherever possible, steam-power is being superseded by electricity. The miners have found that they can haul more coal in less time than by old methods; the rail manufacturers have found a use for power hitherto wasted; the railroads have provided cleaner, safer transportation through long tunnels and in congested city streets.

As the use of the electric locomotives has become more general, the mechanism has been improved. In the Palace of Electricity you can see electric mining locomotives, fitted with electro-magnetic switches, with which a man can control a current that it required five men to control ten years ago. These switches are substitutes for men's hands.

FOREIGN RAILROADS

East of the Pennsylvania exhibit is that of the London and Northwestern Railroad, England's largest railroad corporation. Historic interest in this exhibit centres in the original saloon-coach built in 1842, for Queen Adelaide, the wife of William IV. It is the first royal private car ever built. It is like a stage-coach on trucks, and is 21 feet in length. There are three compartments, which are open to the inspection of fair visitors. The upholstery is cream brocade. The baggage was carried on a platform in the rear of the car. On this coach was the first screw coupler used in England.

The royal coach rests upon a model English road-bed. The 90-pound steel rails are laid on seasoned Baltic ties. Felt is laid between the rail and the tie to prevent the cars from jolting.

The average speed of the London and Northwestern is fifty-two and a half miles an hour. English trains are required to make faster time than American trains, for the reason that on account of the comparatively shorter mileage more trains must be run.

A model of King Edward's private car shows a furnishing simpler than the private cars of American railroad presidents. In the car are bedroom, library, and smoking-room. A model of a standard English sleeping-car in use on the London and Northwestern Railway contains eight compartments. The beds are laid across the car, unlike the American sleeping-car berths, which are made up parallel with the car.

The engine mileage of the London and Northwestern every three hours would make a journey around the world. The number of tickets, which are 1 1-4 inches in length, sold during the past ten years, would make a white belt around the earth.

The exhibit of the East Coast Railway, familiar to so many American tourists, shows a model of an English locomotive, lighter than the American locomotives, but capable of the same speed. There is also a model of the Firth of Forth Bridge, the largest cantilever bridge in the world. The East Coast Railway and its connecting lines wind through districts bound up in English history and romance.

The railroad from Stockton to Darlington, the first operated in England, is part of the East Coast system. It was opened for traffic in 1825. The engine was operated by George Stephenson. The train was preceded by a horseman to clear the track of obstructions. Stephenson's birthplace, at Wylam, is on the line.

Rhodesia, the contribution to the British Empire made by Cecil Rhodes, is represented in transportation by an exhibit of the British South Africa Railroad, which has 2,000 miles of road. Photographs of Bulawayo ten years ago show rows of Kaffir huts; pictures of Bulawayo today show a busy city, with imposing buildings. There are 750,000 square miles in Rhodesia. Literature descriptive of this rapidly developing region is distributed in large quantities.

Two kinds of German locomotives are to be

"THE SPIRIT OF THE TWENTIETH CENTURY"

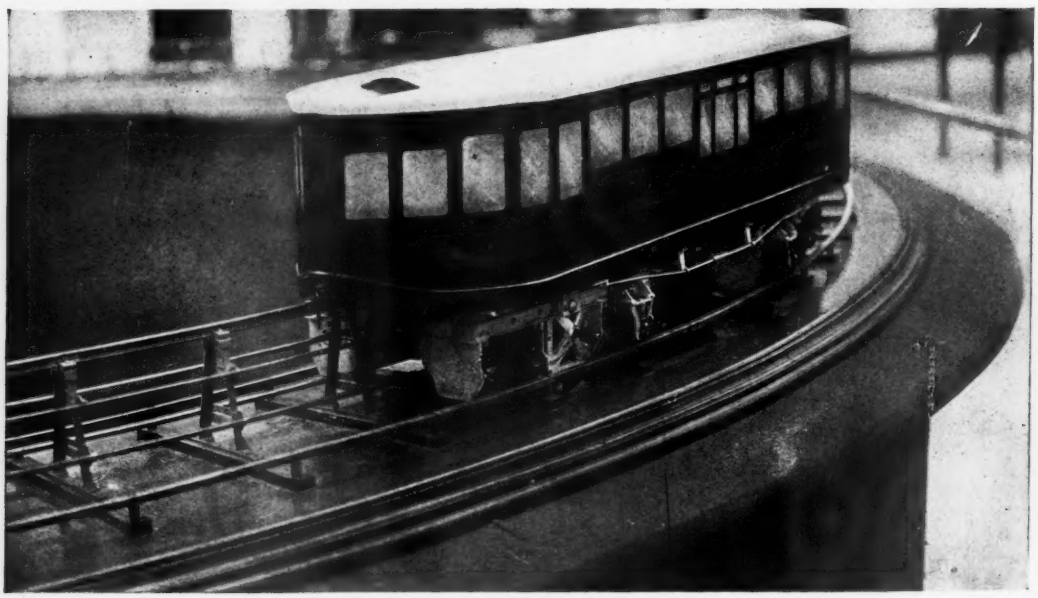
The spectacular exhibit of the centre of the Palace of Transportation

PRIMITIVE TRANSPORTATION
Not an ounce of metal was used in making the cart

seen in the German transportation section, the Von Borries and the Henschell. The average weight of these locomotives is seventy tons, about the same weight as the English locomotives, and considerably less than the weight of those built in America. The German locomotives on exhibition at the Fair are fitted with super-heaters, which give a strong steam-pressure.

STREET-CARS

The first trolley-car used in the United States, in 1887, at Richmond, Virginia, was 18 feet long, heated by a stove, and built on



A WORKING-MODEL OF A NEW RAILWAY-CAR
To run between Liverpool and Manchester at 80 miles an hour

QUEEN ADELAIDE'S COACH
The first royal railway carriage constructed

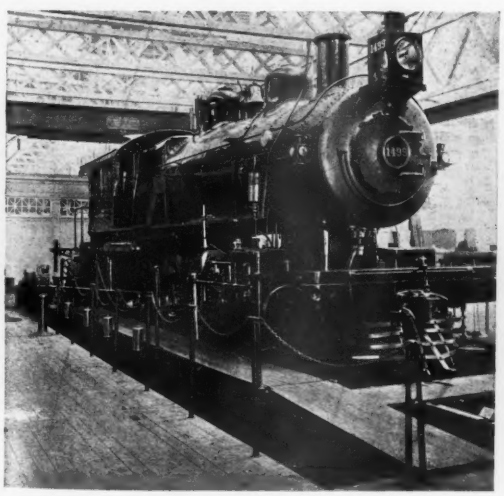
one truck. The seats were hard benches. Today the most approved interurban cars are 45 feet long, upholstered, and heated by electricity. The exhibit of street-cars shows, with original cars and models, how our city electric transportation has developed.

The newest street-cars exhibited show that the tendency in street-car construction is for comfort. For example, in the latest electric cars there are no straps for the people who stand. Instead, there are handles on the backs of the seats, easier and more comfortable for the use of women. Some new cars exhibited by the American Car Company have double floors to deaden the sound of the motors. There are wide elbow-rests at the windows. The capacity of street-cars has increased from eighteen people in 1887 to sixty in 1904. Cars with seats on the roof are to be seen. Short electric cars for export use

THE FIRST LOCOMOTIVE TO DRAW A CAR IN THE UNITED STATES

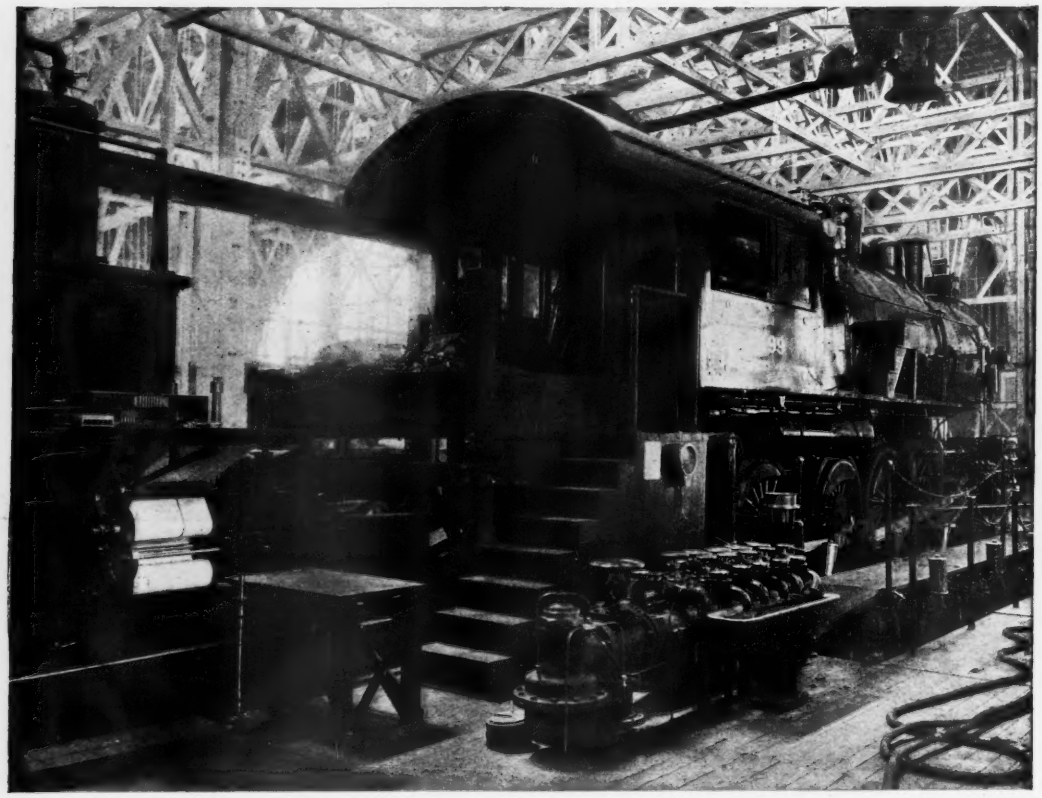
in Buenos Ayres may be seen in this section. One of the long cars for the New York subway is here too.

But the tendency in new street-car construction is not wholly for comfort. Safety is combined with the latest inventions. On the majority of electric cars, should disaster befall the motorman, the car would plunge on, with current unchecked, often to wreck. In the Palace of Electricity may be seen the safety-clutch handle, a knob attached to the controller. The motorman presses this knob down with his palm as he operates the controller. Should he faint or be injured or lose



A 150-TON LOCOMOTIVE

THE "ROCKET" AND THE "NOVELTY"
Models of famous engines in the London-Manchester test



THE LOCOMOTIVE TESTING PLANT

control of the car in any way, the moment his hand is removed from the handle the knob flies up, shutting off the current and turning on the air-brakes, thus automatically stopping the car at once.

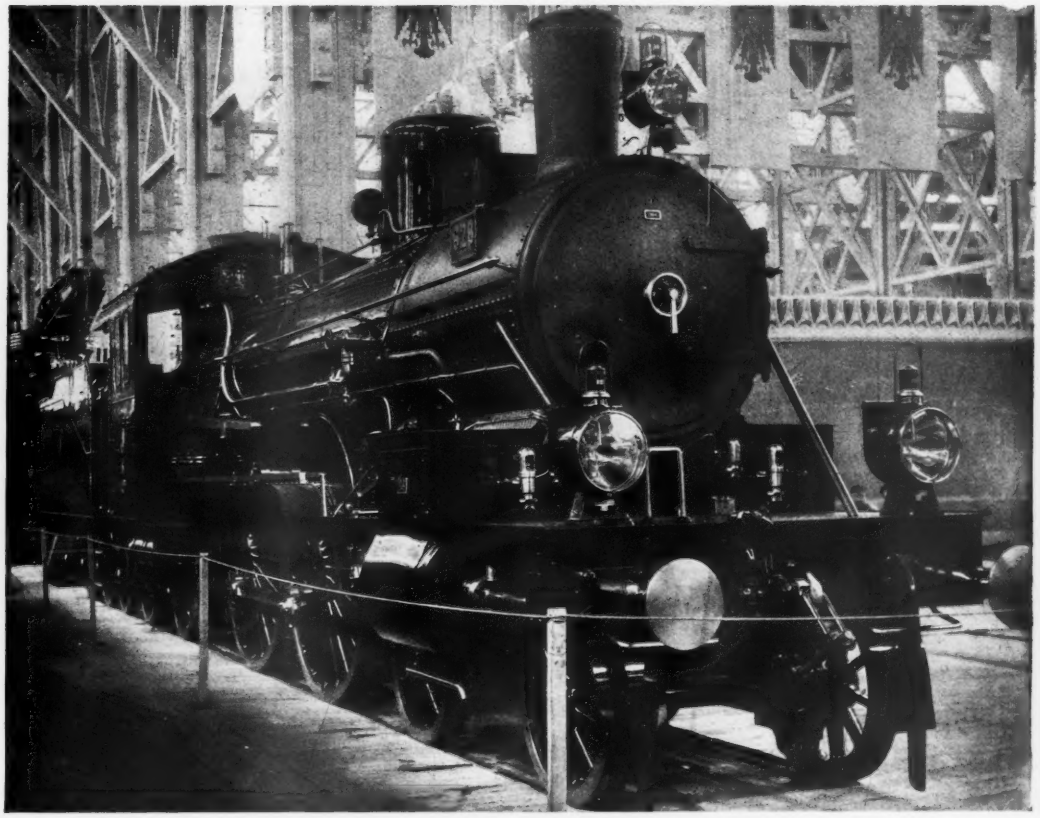
A SECTION OF THE NEW RAILWAY TUNNEL UNDER THE HUDSON RIVER

AUTOMOBILES

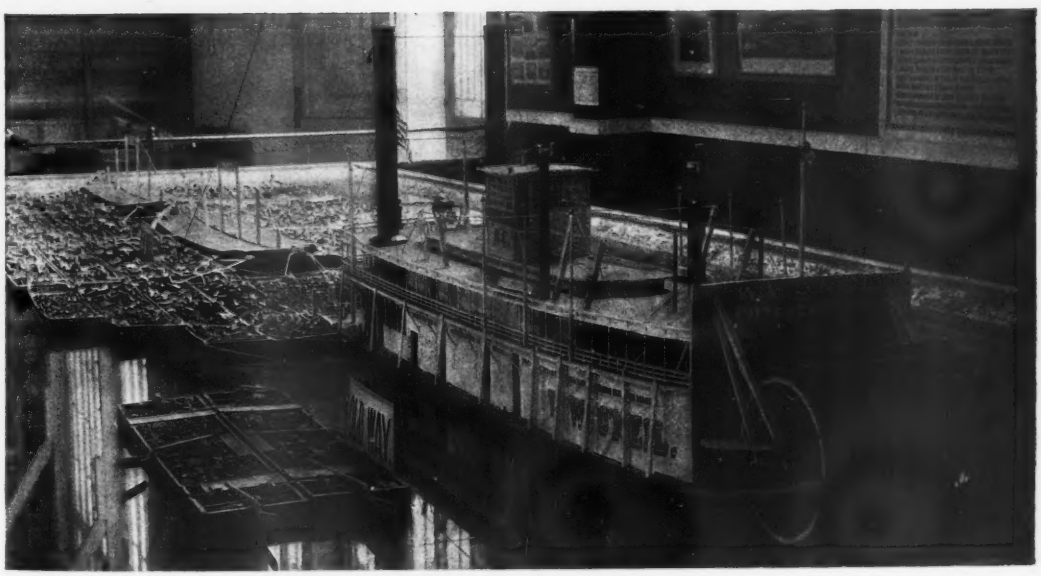
At the Chicago World's Fair there was no exhibit of American automobiles. In the northeast corner of the Palace of Transportation at St. Louis, under a yellow-and-white canopy, are two acres of automobiles, representing nearly a hundred American builders. The exhibit is made under the auspices of the National Association of Automobile Manufacturers.

One hundred and forty cars are shown, ranging from the first Duryea gasolene machine, that traveled 100 miles in nine hours, to the swift electric car that easily travels forty miles an hour.

The newest use of the motor-car is for the railway inspection car. Formerly, those short cars were operated by hand. One exhibit shows them equipped with gasolene motors. The Japanese government recently ordered sixty of them. Among the cars



A GERMAN LOCOMOTIVE



THE OLD AND NEW WAYS OF PROPELLING BARGES

A FAMILY PARTY SEEING THE FAIR
Groups like this may be seen anywhere

A DETERMINED SIGHT-SEER

shown is that used by Mr. M. C. Krarup in his remarkable automobile trip across the continent. It is a gasolene car. The distance from San Francisco to New York was covered in sixty-two days.

Automobiles are used by letter-carriers to collect mail at the Fair grounds. It is the first use of the automobile for this work yet made in the United States.

Occupying a corresponding place on the other side of the building is the exhibit of forty foreign automobiles, all French. Built for roads much better than ours, they are generally finer in construction than the American cars. The majority are gasolene. The largest and most expensive is a Dietrich touring-car, built like a coach and valued at $18,000. The owner can sit inside the car, and, by a switchboard, direct his chauffeur. On the board inside are these directions: "Go fast," "go slow," "left," "right," "stop," "go home." A list of these directions on a celluloid plate is before the chauffeur. The man inside indicates the way he wants to go by pushing a button which points an arrow on the chauffeur's plate outside. This car is finished in mahogany, and has a buffet.

The French cars are trim and graceful. They are built for long journeys over good roads, while American cars are adapted to worse roads. The French machines are more expensive than the American.

PALACE CARS

American railroads lead the world in the luxury of their equipment. Since the first sleeping-car in the United States, in 1867, the advance has been rapid. The Chicago World's Fair showed a tendency in Pullman cars toward ornate decorations. The Pullman exhibit at St. Louis, however, reveals a change for comfort and simplicity. For example, in the latest day-coaches there is a swinging wooden door a few feet inside the car door at each end to prevent draughts from the frequent openings of the outside door by the conductors. The overhead racks are being superseded by spaces for storage of baggage under the seats. The chairs in the chair-coaches revolve. In the standard sleeper, electric lights are sunk in the window-frame, so that people in the berth may read after they retire.

The private car, exhibited by the Pullman Company, is sumptuously finished in Louis XIV. style. It is fitted with a bathroom and

library. The dining-car is finished in Flemish oak. The whole Pullman exhibit is on a scale to impress the fact that $66,000,000 is invested in sleeping-, private, and dining-cars in the United States.

and eight hours, the models of the large vessels in the service are shown down to the *Carmania*, now building, which will be of 65,000 horse-power, and which is expected to make the trip considerably

A COUPLE FROM THE COUNTRY — AND ONE FROM THE CITY

Transportation by sea is fully represented. The evolution of fast transoceanic travel is explained in the exhibit of the Cunard Line. Beginning with the model of the *Britannia*, of 403 horse-power, the first steamer in the company's service, which made the trip from Southampton to New York in fourteen days under five days. The *Carmania* will be 672 feet long.

A life-preserver, 30 feet in diameter, and suspended by masts, marks the entrance to the North German Lloyd Steamship Company exhibit; guarding the west entrance are heroic figures of Roland, the knight of

THE INDIANS ARE AN ATTRACTION ON THE PIKE

A GROUP OF BOERS

medieval times, and Bismarck, the maker of modern Germany. Inside the circle formed under the huge life preserver is a model of the company's piers at Hoboken.

The Hamburg-American Line is represented by a cross-section of the *Deutschland*, which made 23.51 knots an hour, the fastest time across the Atlantic.

A man who has never been aboard an ocean steamer may get a good idea of the construction and arrangement of such a vessel by the longitudinal section of the *Kaiser Wilhelm der Grosse*, which is illuminated by lights in the rear. In this exhibit is shown a new kind of single propeller, designed for transoceanic liners. The blades are braced by heavy steel bars. Propellers now in service have no such brace.

The White Star and American Steamship lines have sections of cabins and saloons which show luxurious equipments.

AIR-BRAKES

In 1872, when air-brakes first came into use, cars of a long train were stopped one at a time. The high-speed automatic air-brake which is exhibited by the Westinghouse Air-Brake Company is capable of stopping both sections of a train that has broken in two on a grade.

The exhibit contains a small working-model of suburban cars stopped with new automatic brakes that couple the cars and steam-pipes at the same time. There is also a working-model of the regulation Westinghouse air-brakes operated on six trucks.

The new magnetic brake, which stops a trolley car going at high speed in half a second, is demonstrated by a model of a truck operated by electricity. It is started at the rate of twenty miles an hour, when, suddenly, as it is apparently about to smash into the bumper posts at the end of the track, the magnetic brake is applied by the turn of a lever, and the truck stands still.

GERMAN RAILROAD STATION

Detached from the Palace of Transportation, but an essential part of the transportation exhibit, is the model German railroad signal-station covering two acres of ground between the Palace of Administration and the Forestry Building. It consists of the station-master's office and the electric signal-towers. There are seven tracks. The operators sit in the towers and operate switch-boards which regulate the switches. Modern iron German signal-posts in use on all German railways are here. A vital difference between German and American switching is that under every German interlocking switch is a small dynamo which generates the power to turn the switch. American switches have no such arrangement. There are fewer wrecks from open switches in Germany than in the United States. The station is one of the exhibits of the Royal Prussian Railroad Commission, and was installed at a cost of $65,000.

TOW-BOATS

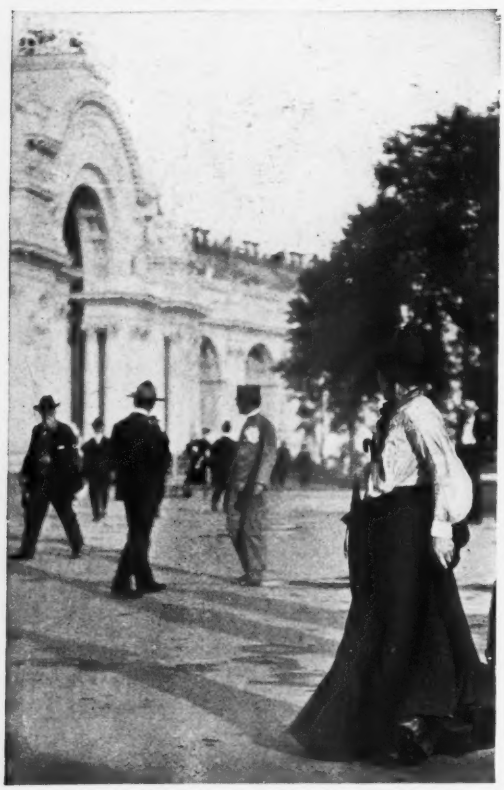
At the south side of the building, just west of the Cunard exhibit, is a striking example of the advance in transporting coal by water. In a miniature river stands the giant tow-

boat *W. W. O'Neil*, owned by the Monongahela Coal and Coke Company, of Pittsburg. Massed before it is a tow of thirty-two coal-barges, representing the usual work done by this steamboat. The barges are grouped about two model barges in the centre. In actual size, these barges contain 725,000 bushels, or 32,000 tons of coal. It would require 1,000 railroad cars, or twenty-five trains, six miles long, to convey the same amount of coal on land. The *W. W. O'Neil* is a type of the latest tow-boat. Her engines are 1,500 horse-power. Alongside this massive steamboat, with its large tow and representing the new method of conveying coal, is shown the old way of carrying coal down the Mississippi and Ohio rivers, represented by two barges lashed together and propelled by long paddles, operated by Negroes. Frequently these barges were months in going from Louisville to New Orleans. The *W. W. O'Neil* tows thirty-two loaded barges the same distance, and returns with a load of empty barges, in thirty days.

THE ESQUIMAU LADY AND THE BABY-CARRIAGE

The steady progress of Mexico in the arts of peace and war is shown in a comprehensive exhibit located west of the Baltimore & Ohio historic section. In one corner is a model light-house. Elaborately embroidered and silver-mounted saddles, so popular with the Mexican vaqueros, may be seen in number mounted on wooden horses. A well-built tally-ho indicates that carriage building has advanced, while a model of the harbor of

ANXIOUS LEST THEY SHOULD MISS SOMETHING



ALL SORTS AND CONDITIONS OF AMERICANS

Salina Cruz shows an achievement of Mexican engineering. Considerable space is devoted to statistics of the Post-Office Department, which has attained a high degree of efficiency during the past ten years.

MISCELLANEOUS EXHIBITS

Near the centre of the building, just east of the Brazil section, is a group of Field Museum exhibits, showing primitive means of transportation, from the dromedary that crosses the hot African desert sands to oxen drawing cumbersome carts made entirely of wood, in Spain. A hogshead of tobacco, attached to a pair of oxen, shows the method of hauling in Colonial Virginia days. There are mule-litters used in Jerusalem and pack-llamas in service in South America. This whole exhibit is a necessary link in the story of transportation.

The motor-boat is represented by large and small models from ten to sixty horse-power. The power for these boats is acquired from gasolene, which is cheaper than steam-power. All the motor-boats shown are pleasure boats.

At the extreme east end of the centre aisle, displayed in three rooms, is the exhibit of the Aerou Swiss War Museum. This museum contains relief models of all the great battlefields of history, and many of those of wars in which the United States has been engaged may be seen. For example, the map of Gettysburg field tells comprehensively the whole story of that notable engagement. The Confederate forces are indicated by red squares and the Federal armies by blue. Accompanying the map is a lucid diagram showing the progress of each day's fighting. This exhibit is one of value.

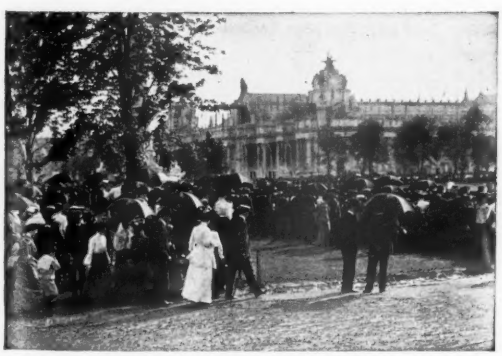
In the wagon exhibits, which occupy large spaces at the west and northwest sections of the building, is the latest convenience for transporting the sick or injured. It is called the invalid carriage, and can hardly be distinguished from a brougham in general use. It is fitted with a lounge for the patient and folding-chairs for the doctor and nurse. It is designed to avoid the publicity that the conventional ambulance creates.

Twenty-five years ago, railway and street-cars were heated by stoves. The exhibit of car-heating companies shows processes of heating by steam, hot water, and electricity. Thus, a great danger of burning coaches after wrecks is, in a measure, avoided.

ONE WAY TO SEE THE PIKE

Formerly, when trains were wrecked, great difficulty was experienced by wrecking-crews in removing locomotives from the débris. Mounted on a flat car is one of the strongest steam-cranes ever built. It can lift a 200,000-pound locomotive as easily as an ordinary derrick raises 500 pounds of stone.

At the Chicago Fair, the largest freight-car displayed had a capacity of 80,000 pounds. Scattered on various tracks in the railroad exhibits are pressed-steel cars with a capacity of 100,000 pounds. It is a result of the increase in the weight and hauling power of locomotives. Refrigerator cars 90 feet long, equipped with complete cold-storage plants, may be seen.



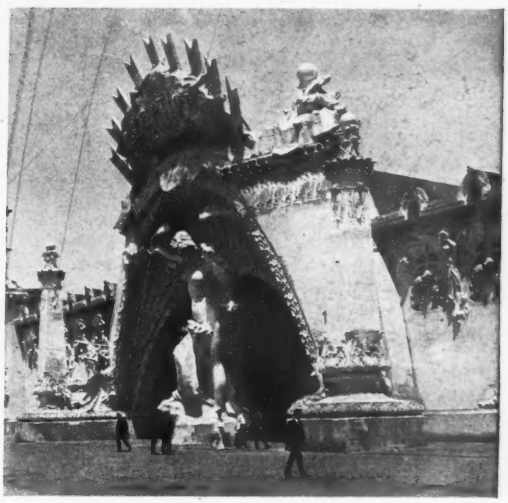
THE SIGHT SUREST TO ATTRACT A CROWD IS A MILITARY PARADE

In the German section is a reproduction of the Royal railway station in Berlin. In the same section are photographs of the noted Elberfeld-Barmen electric railway. The cars are suspended in the air from iron girders, and travel at the rate of sixty miles an hour.

The Germans also show a balloon as a method of swift transportation. Indeed, the whole German section is an application of rapid transit of all kinds.

WHAT IT ALL MEANS

The engineer who operated the first railroad train in the United States died recently.



THE GIGANTIC STATUARY IN FRONT OF A PIKE SHOW

Within the lifetime, therefore, of a single man, the whole remarkable evolution of steam-power for transportation, practically a thing of yesterday, has been made. From fifty tons, the locomotive has grown to the 230-ton giant. The limit of weight has been reached. The refinement of mechanism must now be studied. It is being done in the testing-plant, the work of which points the real significance of the whole transportation exhibit—the desire to find out just what the locomotive can do. For, pressing the steam locomotive for a larger place in the world of work, is the electric locomotive, which is rapidly being adapted to useful activities, and behind it lies the problem of the superseding of steam-power for land transportation.

A BIT OF THE ORIENT ON THE PIKE

THE PEOPLE AS AN EXHIBIT

BY

WALTER H. PAGE

IT is a dull person who does not enjoy the crowds of people. At no other place do the masses of American folk from every part of the country go in family groups. You may see good representatives of every class of people that ever goes away from home.

They all come, too, in a holiday mood. You will commit no impropriety by beginning a conversation with anybody. You may make the acquaintance of a farmer and his family from Kansas, a teacher (of either sex) from Massachusetts, a cotton-planter from Georgia, a cattle-raiser from Texas—all within an hour or two, if you have even the slightest knack of making yourself interesting.

The people are in a holiday, communicative, inquisitive mood; but it is not an idle mood. They are very much in earnest. If you stand a moment, for example, at the German exhibit of artistic rooms, you will hear one woman say to another, "I see how I can make my dining-room much prettier." Everywhere they are learning something. Wherever an idea may be got, there is a crowd. They ask questions frankly and directly. "I wish to know how to do this." "I want this." It may be a typewriter that will write with two colors of ink; it may be a new kitchen utensil; it may be a new idea in education. A young woman, accompanied by two beautiful children, was looking at the specimens of work done in the Menomonie (Wisconsin) public schools—work in drawing and in wood and in iron and in sewing. "And this was done," she said to the person who explained the exhibit to her, "by children no older than mine? My husband is a member of the school-board in the town where I live; and we must have courses of study like these."

It's a constant inspiration to watch this

never-ending stream of intelligent, inquiring, cheerful men and women, whose dominant mood is a mood to learn. They are using the Fair, as they use everything else, to lift their lives higher. The cheerful and frank earnestness that they show is as interesting a fact as you can find in the world. "I put them against the world," said a widely traveled man, when he saw great piles of corn in the Palace of Agriculture, over which is a placard, "Grown by the Farmer Boys of Illinois," and attached to every pile of ears is the photograph of the boy who grew it, with his name and address.

ACHING ARMS DO NOT COUNT IN THE FACE OF SUCH MARVELS

THE LADY BROUGHT A HEAVY FUR COAT—AND HER HUSBAND CARRIED IT THROUGH THE HOT JUNE DAYS

You may discuss great fairs—their advantages or disadvantages to the cities in which they are held, the losses they cause stockholders, the wisdom or the unwisdom of the appropriation of public money to them—the fact remains that they play an important part in the education of the people. And they reveal the eagerness of the people to learn. The unrestricted opportunity of our democracy has brought an unrestricted ambition to know both useful and beautiful things. The people are at school here; and the wise exhibitor is the exhibitor who teaches something. No good idea is lost on these people.

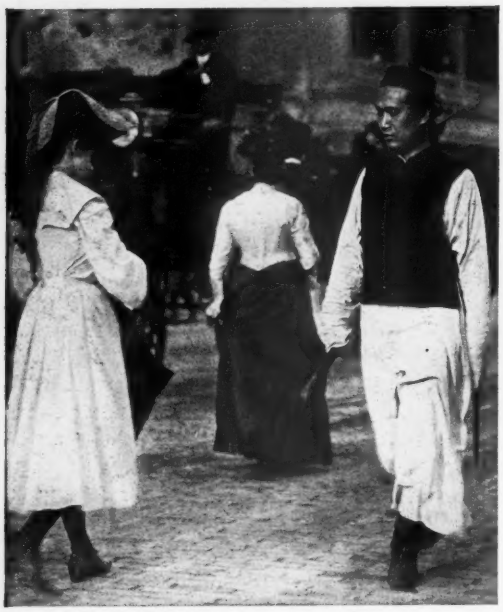
The feeling that you have, after wandering about for weeks in the crowds—and the crowd changes every few minutes, whether you stand still or go on—is that every art and industry and every application of science and of ingenuity will, sooner or later, minister to American life over the length and breadth of the land.

"We need Japanese artists to work among us," I heard one man say to another, at dinner in a public place. "We must teach their method—put their point of view to our pupils." And he asked a Japanese gentleman near him how many Japanese artists are at work in the United States. In precisely the same tone, I heard one man say to another, as he stood by the great boilers in the power-house and asked questions about the automatic coal-stokers: "Well, John, this convinces me. We must put these things on our furnaces." The teachability of the masses of the people is the great social fact that a fair demonstrates; and many of them are apt pupils.

Their frankness and their good humor are

THE INDIAN LOSES NO TIME IN MAKING FAIR ACQUAINTANCES

universal qualities. Nobody loses his patience. A cheerful helpfulness seems to be an American trait. If you offered to carry a country-woman's lunch-basket or her baby, she would consent if she were really weary; and, if you proved a pleasant companion, she would invite you to share her lunch. When you and her brood and her husband and his mother and four friends had all eaten, she would carefully pick up the paper and egg-shells, and send one of the boys to put them in a trash-barrel.



A CHINAMAN ON THE PIKE

The country people are here—thousands of them. You see old men dressed in their "Sunday clothes"—long black coats and black trousers. Old fashions and odd fashions, and no fashions at all, there are in abundance. But you do not see the "hayseed." The countryman of the comic papers does not exist.

Perhaps there was such a person a generation ago, but his son has money in the bank. At least, he has good "store clothes" on his back. He does not use bad grammar. His wife is well dressed; his daughter even better; and his children are neat. They attend good schools. They make a better appearance by far than the village folk of a generation ago made.

You see Scandinavian faces, Irish faces, of course, now and then Italian faces, Hebrews too, and German features. But none of these appears in sufficient numbers to disturb the general impression of the prevailing American appearance, tone, and attitude of mind. They all seem to be American citizens. Everybody has a manner that shows a sort of proprietary interest in the Fair, and in the Republic itself. You hear them talk about what *we* are doing to teach the Indians or the Moros; what *we* are doing in electrical advancement; what *we* are doing in naval practice or in the propagation of fish.

Just as the "hayseed" mode of dress has passed, so have passed, also, the coarse joke and the exaggerated manner of the period of Mark Twain's early books. The affectation of roughness and of coarseness in speech or in deportment—you see nothing of this among the people anywhere here.

But you do notice not only the acute patriotism indicated by their interest in the exhibits of the United States Government (we get few hints in political newspapers and discussions of the genuine pride that the people feel in our country and in our government), but you discover also the passing of the narrower provincialism of a few years ago. Everybody who comes here—country-folk and all—has an intelligent interest in the foreign exhibits, in the foreign buildings, in facts about the life, the work, and the arts of other peoples.

The outdoor parts of the Fair hold their attention, too, especially the horticulture and the sports. Appreciation of manly sports is fashionable under this consulship; but it is

very genuine. If one could take a measure of the deep change that has come in the character of the people—say, since the Chicago World's Fair—by reason of their love of games and contests and sports, it would show a surprising transformation. The increasing love of shrubs and flowers and landscape is an oft-told story; but every day one may see hundreds of evidences of it.

A man who seriously considers the great social and political problems that beset us, and who knows that their solution at last must depend on the character, the intelligence, and the teachability of the masses of the people, will find the people the most interesting exhibit at the Fair; and he will come away from a month's observation of them and mingling with them with a renewed confidence in the soundness of their character and judgment.

It would be a foolish effort to guess what subjects the great mass of the people are most interested in. But it is significant to see the women everywhere studying the exhibits that give hints of better home-building—the cooking-school, the food exhibits, the furniture, the education exhibits; and the men gather wherever machinery is shown, especially if it be in motion. The easy, American adaptation of machines to doing the work that muscles once did shows itself in the crowds that you see here.

Another feeling that ripens into a conviction is that we are yet in the exploiting era of our development. You expect to be invited to settle in Oklahoma. But you are hardly prepared for this invitation: "Come east, young man, and make your home in Rhode Island." Canada has elaborate exhibits and much "literature" designed, avowedly, to tempt the American farmer to the wheat-fields of the North. "The German educational exhibit," remarked an American scholar who was trained in Germany, "is admirably devised to attract young Americans to university work in the Fatherland." The note of exploitation is heard everywhere—not vulgarly; but, in all truth, we are yet in our exploiting era. The future holds more than the past has yielded.

Even a cursory study of machinery and of processes brings the same feeling. Everything is in an experimental stage. Many machines that were new when seen at Chicago eleven years ago have now chiefly a historical interest. Close beside every inventor is a scrap-heap.

THE TWO COUNTRY LADIES IN THE CLUTCHES OF THE "BARKER"

Everything is a passing show, except the soil and the people; and we have only begun to learn the capacity of either land or men.

IN FRONT OF A PIKE SHOW

THE HON. DAVID R. FRANCIS

President of the Louisiana Purchase Exposition Company

The man who made the Fair

THE IMPROVEMENT OF EDUCATION

A COMPREHENSIVE AND WONDERFULLY DIVERSIFIED DISPLAY—SURPRISING UNIFORMITY IN THE METHODS OF THE DIFFERENT STATES — AN AGE OF MANUAL TRAINING — THE SCIENTIFIC ACTIVITIES OF THE COLLEGES —HOW FOREIGN EDUCATIONAL INSTITUTIONS COMPARE WITH OURS

BY

OTTO HELLER, PH.D.,

OF THE FACULTY OF WASHINGTON UNIVERSITY, AT ST. LOUIS

FOR the first time in exposition history we behold education fittingly housed in a splendid palace of its own. This building covers a floor-space of 290,000 square feet, and, because of its pure classic architecture, is by many pronounced the most satisfactory of the Exposition buildings. On its construction the sum of $400,000 was spent. For the grandeur of this scale two reasons are assigned. First, there has been an improvement in expositional modes, so that educational exhibits are capable of greater attractiveness than formerly, and the modern methods are applicable to a wider range of subjects. In the second place, the present educational era lays more stress on the tangible and demonstrable. Both statements are proven by an inspection of the building.

The classification adopted by the chief of the department, Mr. Howard J. Rogers, comprises seven groups of exhibits, dealing severally with elementary, secondary, and higher education; special education in fine arts, in agriculture, in commerce and industry; and special forms of education.

The emphasis of repetition is placed on some leading features of the pedagogic practice of the day. In a country whose schools are not forced into uniformity it is amazing to observe such unison as is here seen.

Here is a salient point in the difference between the schools of Europe and our own. They lead the public sense; ours follow it.

Just now there is a loud and general clamor for manual training, but not, if I interpret the State exhibits rightly, for the type of schools known as "manual training schools," and created, if I mistake not, as a result of the work shown at the Philadelphia Centennial Exposition. That sort of school is growing obsolete. Nowadays, manual training is taught in nearly all grades of schools, but only a moderate amount of time is allotted to it. This, to be sure, is not the first impression gained from the State exhibits. The temptation to exhibit actual and tangible results of their labors has evidently been too strong to be resisted by teachers, and the layman, as he wanders from cabinet to cabinet, begins to wonder if *only* manual training in its various forms is taught nowadays; if reading, writing, etc., are no longer part of a public school education. It is quite reassuring to be told by those in charge that such is not the case; that this vast amount of wood-carving, forge-work, and dainty stitching is done in instalments of time no greater than those assigned to other studies.

The results of the whole movement, which is so entirely in accord with the predominance of technical education, show clearly that the American child—boy or girl—has a decided natural aptitude and love for working with the hands. It is pleasant to note that this gift is being so intelligently guided by the early artistic training of the child; by the calling of his attention to the simple, graceful lines and forms to be found everywhere in nature, and to their easy and satisfactory adaptability for ornamentation of all kinds. We who went to school fifteen or twenty years ago cannot but note with surprise the importance now attached to training the artistic perceptions in many and varied ways.

As the most telling results of such training, may be cited the work of Sophie Newcomb College, of New Orleans, La., in pottery. It is not generally known that the Newcomb pottery was first made at that school. The industry has grown rapidly, but is still in the hands of women who are, or who have

been, students at Newcomb. The designs for the decorations are all made from the local flora, and no design is ever duplicated.

In wood and metal work, the "Arts and Crafts" style seems to be uppermost. The furnishings and furniture of the Minnesota State Building were all made by pupils in the high schools of Minneapolis and St. Paul.

Of course, manual training may not everywhere be raised to the dignity of higher industrial art. In many places, if not in most, it subserves purely practical ends. A striking instance of fully awakened resourcefulness is furnished by a Massachusetts boy's wireless telegraphy instrument—all put together from near-at-hand materials. The core consists of a gas-lighting coil; the armature, of the wheel of a pulley and a piece of sheet zinc; the contact-screw was taken from an old stove, and the spark-point from an electric gas-lighter. This piece of work shows also how manual training may be interlinked with studies requiring only headwork: which leads me to comment upon another out-standing characteristic of modern schooling—I mean the tendency toward "correlation" of all subjects taught.

The extent to which the idea may be carried is demonstrated by Principal W. A. Baldwin's (Hyannis, Mass.) scheme of "industrial-social education." His exhibit elucidates the art of conducting a school wholly "on a business plan." The pupil is stimulated to cope at first hand with actual commercial problems. He undertakes, say, to rear a brood of chickens for profit. To carry the venture to a successful issue, he must occupy himself with many questions of varied scientific import. He must learn something of business—correspondence, banking, etc.

This will seem to many a startling enlargement of the notion of the school. But it is claimed for that kind of school that the early preparation it imparts for the practical side of life does not detract from the ethical and esthetic value of its instruction. In a less-pronounced form the correlation of school work is carried on almost universally.

A wing-frame, in the California booth, enables us to follow a class of children on an excursion into the country. Their experiences serve as the basis for short compositions. They have learned much about the local geography and the products of the region. For example, they can mark the location of orange orchards on the county map; they know how to draw, or to paint, an orange, and to report intelligently on its qualities, uses, shipment, etc.

In the Mississippi schools, they have even gone so far as to stop all teaching of physics, to make room in the curriculum for the systematic study of cotton—from its rational cultivation up to the time when, in the higher classes, it is woven into cloth of elaborate design.

Missouri, Massachusetts, and Pennsylvania have interesting exhibits of local insects of all kinds, collected and most daintily mounted by the children. The pupils are taught what insects are injurious to vegetation and how they may be exterminated; and, with this army of young hunters after them, we hope soon to see the last of the gypsy moth and kindred pests.

Another direction in which the notion of the school is steadily extending makes for a closer and more lasting connection between school and home. In this regard, the evening schools of Massachusetts are interesting, with their classes in printing, millinery, dressmaking, home-nursing, typewriting, and similar subjects for young people past the school age. Courses of illustrated evening lectures also are frequently given.

It is obviously impossible to give a description of each separate exhibit. Besides, nothing would be gained by it, since, as before remarked, the State displays are almost tediously similar. Aside from the vast amount of basketwork, wood-carving, metal-work, blanket-weaving, and other varieties of manual work, they consist for the most part of photographs of school buildings, of classroom work in all branches from kindergarten to school of pedagogy, and a rather modest array of copy-books, note-books, and collections of exercises. The schools of many States show original compositions on literary or historic subjects, appropriately illustrated, sometimes by small photographs or cuts from magazines and newspapers—more often by original sketches.

Too little attention is evidently paid to penmanship. The vertical handwriting seems to have come into general favor. Whatever may be said for it on the score of hygiene and simplicity, it is not superior to the old-fashioned writing either in beauty or in

legibility. The "Spencerian" style, thank goodness, has had its day. Yet the handwriting of the American boy and girl, by comparison with that of school-children in Europe, is unformed and wholly without an individual character.

Very gratifying is the universal introduction of the laboratory method in the teaching of science, in particular, physics, chemistry, and biology; and, quite in line with it, the spread of the school library. Book-cases containing dictionaries, cyclopædias, other books of reference, and, in the field of literature, at least the major classics of England and America, are finding their way to the smallest country high school. Even below the high-school grade, the use of the library, thanks to such enterprises as the New York State Traveling School Library, is on the constant increase.

As for the modern environment of teacher and scholar, a marked improvement is visible in the external and internal architecture of school-houses and in the equipment of the schoolroom. Even the so-called "rural schools" are now, as a rule, well built, well lighted, and well ventilated. Exceptionally fine specimens of school buildings are shown by Pennsylvania and Minnesota. Great strides are being made in the suitable decoration of halls, corridors, and, especially, classrooms. School-boards are at last discovering that no mysterious pedagogical virtue clings to the blank, staring wall. In St. Louis, and in many other places, there is much private agitation for surrounding the child with a more esthetic atmosphere. Women's clubs all over the country are taking an interest and active participation in beautifying the schoolrooms with reproductions of famous paintings and statuary.

Several art firms are making a specialty of supplying this newly created demand. A. W. Elson & Co., of Boston, show a good selection of framed photographs of a high quality. Far inferior in value, but very much cheaper, are the "Perry pictures." Prang exhibits a series of simple pictures in three colors, suitable for very young pupils. A. W. Mumford, Chicago, has a complete set of studies of birds and flowers in their natural colors. The two last-named exhibits are calculated, not so much to develop the child's artistic sense, as to teach him to recognize plants and birds as he meets them in nature, and to serve as models for instruction in drawing and painting. This method, by the way, would be frowned upon by the drawing-teachers of Sweden or Japan, who use only the natural model.

A fair idea of what is being done in the higher art education may also be obtained. The Chicago Art Institute, the Boston Normal Art School, the Boston Museum School of Fine Arts, the Pennsylvania School of Fine Arts, and the St. Louis School of Fine Arts are the principal exhibitors. The students' work in drawing, painting, sculpture, pottery, and other crafts is highly creditable. The installations of the Massachusetts Normal Art School and the St. Louis School of Fine Arts are models of good taste. In the last-named exhibit, a very handsome fireplace, and, to the left of it, an elaborately carved and decorated wooden chest, deserve special notice; so does the ornamental brass and copper work of the Massachusetts Normal Art School.

It is not possible to dwell lengthily on the innumerable exhibits belonging to the groups of special education in agriculture, commerce, and industry, and of the education of defectives. The agricultural colleges show rapid development along their special lines, as: animal mechanics, study of the products of the earth and their care, of insect pests and their eradication. The Massachusetts Agricultural College shows, among other things, colored imitations of edible and poisonous mushrooms. At last, seemingly, our rural population is to be enlightened on the nutritious and highly palatable qualities of edible fungi, on which subject Americans are still so densely ignorant.

The State school exhibits include, along with institutions for the defectives, viz., the blind, the deaf and dumb, and the feeble-minded, a number of institutions for the reform of the wayward. Half-way between the regular and the correctional school, and, like the latter, of a greater sociological than pedagogical interest, comes a school of more recent origin, intended for children who, because of their rebellious disposition, cannot be governed by the ordinary public-school discipline. Rhode Island has seven schools of this sort, so-called "schools for individual work," to which the intractable are sent; here individual attention is given them, and they are returned to the regular public

schools as soon as their conduct allows. In a class of sixteen children in one of these schools, nine are colored.

Practical demonstration enables the visitor to see some interesting phases of public and special school instruction. In the large and handsome booth of the city of St. Louis regular exercises are conducted in various branches. One may also see an Indian school in actual session.

As object lessons to the visitor, such demonstrations have their value, although, of course, the natural atmosphere of the school-room, and, with it, one of the essential factors in education, is wholly lacking when the teacher and the pupils have to "perform" their work amid such surroundings and in the presence of an audience.

The State institutions for the blind and the deaf and dumb of Kansas, Missouri, Illinois, and Nebraska have sent on whole classes of pupils. They are quartered on the Exposition grounds, under the care of their regular teachers, and receive their daily lessons in the Palace of Education. The blind are taught reading and writing by the Braille method. The curriculum includes, besides the ordinary branches, music and manual training. To see blind boys, aged from twelve to fifteen, handling files, saws, chisels, planes, and other tools with the greatest precision and in perfect safety seems almost like a miracle. The equally beneficent results attained by modern methods in the teaching of the deaf and dumb are likewise made apparent.

COLLEGES AND UNIVERSITIES

The exhibits of the American colleges and universities are situated within the court of the Palace of Education. It cannot be said that this department of the educational exposition is at all representative of the activities of this country in the field of "humanistic" and scientific education.

The authorities of these institutions have apparently realized the difficulties in the way, and, as the easiest solution, have simply abandoned the purpose of adequately exposing a modern college or university curriculum. In this section of the educational exhibit, if in any, combination was required to invest the display with real educational significance. Had the colleges of each prominent type united their forces, we might obtain a bird's-eye view of the prescribed course, the elective course, and the group-course systems. The seven "New England colleges" do, as a fact, occupy a booth in common; only, the arrangement is hap-hazard and, educationally, meaningless. Other institutions content themselves with providing a well-furnished resting-place for the weary visitor. In others still, much, far too much, space is taken up by pictorial and plastic representations of the college buildings.

Unfortunately, this is a sign of the times; we are making much ado about brick and mortar. Why should college buildings be deemed worthy of being made the ostentatious feature as a strictly educational exhibition, unless, indeed, they happen to be surpassingly beautiful or to possess a remarkable fitness for the work that is carried on within them?

Owing to the perfunctory dealing with the true essentials, college exhibits here mark no advance over that made at Chicago in 1893. Yet there has been a very pronounced progress made in collegiate education since then. The university, and even the college, of today is justly ranked according to the scientific activity of its faculty. Consequently, the chief elements of a rational university exhibit can only be the results of the instructors' scholarly labors, made visible in the form of publications or otherwise. In the foreign exhibit this is thoroughly recognized: in the American, only Harvard and Johns Hopkins give central importance to the work of their professors. Both exhibit the collected writings of the whole teaching body, and full sets of the serial publications of the university. Johns Hopkins, for instance, demonstrates by an array of more than three hundred doctors' dissertations produced by its students, how energetically the cause of original research is being furthered by that university. Other exhibits of special value, in the Johns Hopkins booth, are: a series of unexcelled drawings, showing various pathological conditions in the human body, by Mr. Max Broedel, the acknowledged master of his art; the "diffraction gratings," of the late Professor Rowland, which are used to produce the spectrum of the sun or of incandescent substances for examination and measurement, in the place of prisms; an apparatus designed by Professor Mackenzie (now of Bryn Mawr) for the verification of Newton's law of gravitation.

The Harvard booth is no less interesting. In the centre stands a kiosk lined with transparencies of the "Draper Memorial Photographs." The photographs are taken to determine the double character of certain stars. Before they were photographed by this method, stellar spectra were fixed on the plate only one at a time, and only about one-quarter of an inch in length. Since then a thousand spectra have been shown on a single plate. We note further in the Harvard booth a number of the celebrated glass models of flowers from the University Museum, very perfect specimens of Blaschka's art. The case also contains enlarged sections of the same flowers. Out of the 1,500 new compounds discovered in the Harvard Chemical Laboratory, 250 are exhibited. Two "zoötropes" are kept in operation, demonstrating, by means of X-ray photographs, the movements of the stomach and intestines during the digestion of food. There is, further, a fine collection of pathological microphotographs. A Minot (wheel) microtome is shown—an instrument especially designed for making serial sections of organisms for microscopic slides. Finally, the scope of medical education as it is carried on at the present time is well indicated by a good model of the new Harvard Medical School that is to be erected in Brookline. The school has lately been endowed with a sum of more than three million dollars, by Messrs. Morgan, Rockefeller, and Sears, and Mrs. Huntington.

TECHNICAL SCHOOLS

The higher technical schools are partly included in the exhibits of the universities, since in this country most universities carry on an engineering department. This is true, for instance, of Cornell, Yale, Harvard, and Columbia. The independently organized technical institutions do not occupy space commensurate with their prominence. The exhibit of one of the smaller and lower schools of this kind, the Bradley Institute, of Peoria, Ills., is in some respects the most satisfying, because it conveys a clear notion of the work of that school in the usual high-school branches, and also in the handicrafts. The department of horology exhibits a clock entirely made by students.

The architectural arrangement and decoration of the exhibit made by the Massachusetts Institute of Technology, the leading school of the technical type in the United States, is highly pleasing. The exhibit itself is purely graphic.

The Worcester Polytechnic Institute has on view a number of practical exercises, selected from the experimental part of a course in elementary dynamics. Each of these exercises is performed by the student after the corresponding part of the theory has been taken.

FOREIGN EXHIBITS

To the American teacher the foreign exhibits will unquestionably be more instructive than those of his own country. As in some other departments of the World's Fair, the German section is the richest in material. Its study is facilitated by a thoroughly methodical arrangement which seeks to bring out the organic interrelation of all the parts. The problem is admirably solved, thanks to the great pedagogical knowledge and practical sense of men like Professor L. Bahlsen, who spent many months in planning and building up a most complete exhibit. Indeed, it may be claimed without exaggeration that the German Government has shown to what point education is capable of exhibition. At the same time, Germany proves at St. Louis, if the proof be needed, her superiority in the field of science and what is inseparably connected with science, the higher education. It is greatly to be regretted that the unity of the exhibit was disrupted by locating a part of it outside the Palace of Education. This became necessary because of the extraordinary extent of the German exhibit. In the Palace of Education it occupies more than thirty compartments, covering, in all, 27,000 square feet of floor space. An additional area of 10,000 square feet is taken up by the German educational exhibit in the Palace of Electricity.

Comprehensible and almost self-explanatory as the arrangement is to the pedagogical expert or student, the layman will do well to avail himself of the aid of the special department catalogues that have been prepared for his guidance.

The exhibit, as a whole, was designed to be illustrative of German education in its entire range. It comprises, accordingly, the "Hochschulen"—i. e., university and ad-

vanced technological school; the "higher schools," corresponding to our colleges and the upper classes of the high school; "Mittelschulen," corresponding to our high school in the lower grades; lower and elementary schools, and schools for the defectives. Thanks to the uniformity of German schools, it was feasible to represent each branch of the system by a single example, save where an advantage was to be derived from a parallel. The German school system, despite its great regularity, is far from monotonous; in truth, it is more richly differentiated than our own. There are, for instance, no less than twelve distinct types of "higher" education of the undergraduate character: the humanistic "Gymnasium," the "Realgymnasium," the "Reformgymnasium," which by dint of greater flexibility is able to prepare for both university and engineering school; the "Alumnat," "Paedagogium," three kinds of "Realschule," Girls' High School, Girls' "Gymnasium," and Teachers' Seminaries for Men and Women; not including special schools for commerce and the industries. Each department of the exhibit is methodically subdivided. For example, we find in the "Hochschule" group a separate archæological, medical, etc., section. Beyond this there is a still further subdivision. The medical section has subsections for therapy, pathology, anatomy, surgery, bacteriology, etc. A complementary feature of the German exhibit is a lecture hall with a seating capacity of one hundred, fully equipped with experiment tables, apparatus for projecting pictures on the screen, and mechanical appliances for instantaneously darkening the room. Here lectures and demonstrations are given for small audiences of specialists. Lectures of a more popular interest, as on color-photography, are given from time to time in the German Pavilion on Art Hill.

Perhaps the most lasting contribution of Germany to the educational exhibition at this World's Fair is a four-volume series of monographs, written by eminent scholars. The collection, which is edited by Professor Lexis, may be inspected in the "Court of Honor," or main entrance to the German section. It was prepared expressly for St. Louis, and is the most complete and authentic exposé of German education in all of its forms and aspects. Only a very few objects in this very remarkable exhibition may be rapidly pointed out at random: the model of the restored Roman citadel at Saalburg, as showing a practical achievement of modern archæology; the splendid model of the "Technische Hochschule," at Berlin-Charlottenburg, the largest single building in the world devoted to educational purposes. In the medical subdivision, the graphic elucidation of the present campaign for the suppression of tubercular diseases; the anatomical and pathological specimens preserved in the so-called Kaiserling fluid, in which they retain their natural colors for an indefinite time; colored casts illustrating various special surgical operations. In the division of scientific instruments, many fine pieces of apparatus used in astronomy, meteorology, optics, and so forth.

The German instruments have the highest reputation for accuracy and durability. Many of the instruments, including a large electromagnet and an oscillograph, are shown in operation. Of special interest is the "ultramicroscope." Through its lense, particles hitherto invisible may be plainly distinguished. Of striking novelty are the small chemical vessels of molten quartz—the only ones of their kind ever made. Their prices run into the hundreds, but they have the advantage of being practically indestructible. They may even be dropped at white-heat into cold water without danger of their breaking.

Of great historic interest is the laboratory of a sixteenth-century alchemist, in the German educational section of the Palace of Electricity. Opposite it, in exact reproduction, Liebig's first laboratory (1835) is seen. The chemical industries are well represented by their products. Truly astonishing is the delicacy and great variety of artificial (chemical) perfumes produced by one firm.

This brief sketch conveys no adequate notion of the educational importance of the German section. Teachers of the higher grades can do no better than to devote several days, or at least one whole day, to its study. As the school exhibit is arranged according to the subjects taught, each teacher can find, without loss of time, whatever is of special professional interest. With the charts, models, specimens, etc., used in connection with a subject, go the text and principal reference books. Those following pedagogy as a science will not neglect to inspect the collection of German pedagogical writings

surrounding, very appropriately, the bust of Herbart. In every division of the German section the visitor is sure of courteous reception and generous assistance by the gentlemen in charge.

THE FRENCH EDUCATIONAL EXHIBIT

Architecturally, the "key" of the educational exhibition is the exterior of the French department. Its interior, too, is very attractive, and, not having been separated into many small cabins, like the German, it gives the impression of great spaciousness. Without aiming at the comprehensiveness of the German exhibit, the French have succeeded in giving a fair idea of the educational activities of their country, notably of the city of Paris. A too large part of the exhibit, however, is surrendered to things that have nothing, or very little, to do with education—a miscellaneous assortment of posters, such as are used by the police and other authorities of France for public announcements. It is plain that France has tried to combine the educational with the sociological feature. But many of the objects shown seem, even sociologically, irrelevant. Nevertheless, the exhibit made by the French Department of Public Instruction, taken by itself, is capital.

One feature of the public-school system of France (and of other European countries) deserves to be adopted here. Connected with the training-schools for teachers are so-called *écoles annexes*, where the novices put in a week of service, afterward submitting a report on their observations and experiences. If such a system be used with the proper moderation and care, there need be no danger of its converting our school-children into "experimental rabbits." The fact is, on the contrary, that they are exposed to that danger when placed in charge, as is very often the case in this country, of a teacher who is without any class-room experience whatsoever. The St. Louis method of appointing annually a certain number of "apprentices" is a long step in the right direction.

THE BRITISH SCHOOL EXHIBIT

The British school exhibit is considerably smaller than the French, and less inclusive. Yet, aside from university—i.e., "graduate"—work, which in the French exhibit is represented by many publications, all types of schools have a place in it. Very fine is the decorative work shown by the Glasgow School of Art, the Royal College of Art, in London, the Craft School, of Bethnal Green, London, and the Arbroath High School of Art, which gives a six-years' course. Britain's superexcellence in the teaching of art, especially "industrial art," can hardly be called into question. Work of a very high grade is also done in the British schools for the defectives. The Royal Normal College and Academy of Music for the Blind is especially worthy of mention.

OTHER FOREIGN EXHIBITS

Italy lays a decidedly one-sided emphasis on art and crafts teaching. Beautiful as much of the carved wood, glassware, and forged metal is, the exhibits, as a whole, have a commercial character, which is only relieved by the numerous portfolios with technical designs.

Mexico's exhibit leaves one in the dark as to whether our neighbor republic is also trying to keep abreast with the present practical tendencies in education. Scientifically, Professor Pastrana's "Nepho-meter" is the *piece de resistance* of the Mexican booth: an apparatus designed to measure the fractions of the sky covered by clouds, and provided with a helioscope in order to facilitate the observation near the sun and for observing the halos. The mineral exhibit is good, so is that of the Mexican *Materia Medica*. The rest is nearly all manual work—the lace-making and embroidery being worthy of high praise. Among the samples shown are some admirable pieces done by little girls of from nine to twelve years of age. The manual work of the boys bears an entirely utilitarian character.

THE SWEDISH EXHIBIT

We may conclude this sketch of the educational department with a brief description of what is in some respects the most instructive exhibit within it, namely, the Swedish. It is neither large nor ambitious, but it comes nearer than any other to portraying the actual school-life of its country. Several of the rooms are furnished and equipped as school-rooms. One is a class-room in an elementary school; another a kitchen, for a cooking-class; a third a Sloyd-room, with three tables, one each for cardboard, wood, and metal work; with each goes a case of tools.

The exhibit emphasizes also the importance attached in the schools of Sweden to bathing, gymnastics, and games. A set of "playing-tools" is shown for the last-named purpose.

The total impression gained is highly favorable to Swedish education. The people of Sweden—in fact, all Scandinavians—respond very readily to the present efforts made to prolong the schooling of the adults, by the establishment of "People's High Schools," similar in grade and method to the continuation schools of Germany and the United States, but frequented mostly by men and women past the age of twenty.

In conclusion, it must be said that a single cursory review cannot attempt to do full justice to the educational departments of the Louisiana Purchase Exposition. Taken all in all, the yield of the enormous labor and expense invested in this feature of the huge enterprise is such as to warrant every teacher in the land in making the pilgrimage to St. Louis. If American teachers will avail themselves in large numbers of the opportunities for observation and comparison there afforded, the educational activities of our country are bound to receive a strong and most beneficent stimulus.

A PANORAMA OF FORESTRY, FISH, AND GAME

CONCRETE EXHIBITIONS OF THE METHODS OF PRESERVING FORESTS AND UTILIZING BEAUTIFUL WOODS IN THE UNITED STATES AND OTHER COUNTRIES—AN UNPRECEDENTED DISPLAY OF HUNTING AND FISHING EQUIPMENTS—WILD ANIMALS AND COUNTLESS KINDS OF FISH—THE WHOLE OUTDOOR WORLD BROUGHT INTO VISIBLE AND ENJOYABLE COMPASS

BY

H. H. KOPMAN

NO hunter, fisherman, woodsman, explorer, or naturalist, however much he had learned from books and travel, can fail to get much information from a visit to the Fish, Game, and Forestry exhibit, in addition to renewing association and acquaintance with the forest, the prairie, the mountain, the jungle, the desert, sea and stream, and the denizens thereof. In the space of a few acres, a large and well-selected proportion of the woods, the fishes and the feathered and four-footed game of the world is assembled. Tropical things are near neighbors to products and specimens of temperate, and even arctic, latitudes.

Inside the building, in charge of Doctor Tarleton H. Bean, honorary Curator of Fishes in the American Museum of Natural History in New York city, the prominent exhibits include the big game of the West, from Colorado, Washington, Montana, and Oregon; and, in private collections, the same class of quarry from the Indian and African possessions of Great Britain; the largest gun collection even made for an exposition, representing a great variety of types, from both American and English makers, and including the remarkable collection of historic firearms belonging to the United States Cartridge Company, which shows the evolution of modern guns; reels and fishing-tackle in profusion; the greatest collective timber exhibit ever made by the Southern States; large live fish and game exhibits, made by Missouri and Pennsylvania; a special exhibit of much beauty, and the utmost significance, by the United States Forestry Bureau; absorbingly interesting displays from foreign countries, notably Japan and Germany; and several State collections of direct interest to the naturalist, because they represent the various fauna of North America. By examination of the exhibits of Louisiana, North Carolina, Virginia, New Jersey, and New York, especially because of their arrangement, one may get very fair ideas of the comparative status of wild life—especially bird-life.

Of the game, probably the most astonishing is the British collection of such related Old-World tropical creatures as the eland, the hartebeest, the gemsbock, and the gazelle. The variety is almost incredible.

The exhibits of the older countries show intimate knowledge and long specialization. Several of the "newer" countries of the world, especially Mexico and several of the Central and South American States, notably Venezuela and Brazil, have a great mass of material, but their resources have yet been exploited only in a superficial way. But Argentina shows a forestry exhibit that argues a clear-cut development of the lumber industry. In the main, however, the tropical American exhibits are mixtures of the gaudy birds of the equatorial regions and the valuable fibres, woods, and nuts and berries of the hot countries. They demonstrate how remarkably prolific are these lands, but how successfully industry may be applied to the undeveloped riches is not shown to a very great extent. Other exhibits that fail to point any particular lesson, serving merely to emphasize the richness of this world in arboreal and lower animal life, are the displays from the East, such as the collections from Ceylon and Egypt. The trophy of the hunt and the adventure in jungle or desert are the prominent themes of their exhibits.

The exhibit of Great Britain runs to guns and big game, and the display is a well-ordered one; and there is an exhibit by the Marine Biological Society of the United Kingdom, giving, by specimen and by chart, many of the most important results of the study of marine life for which British naturalists have become celebrated. Of absorbing interest in this exhibit is the case of specimens of the larval stages of the lobster and other crustaceous animals. These larval stages are the small creatures that form the greatest percentage of plankton, or floating life of the sea. Another significant part of the British exhibit is what the Royal Scottish Arboricultural Society has to show of its work, which consists in naturalizing various foreign trees, especially those of America.

The veneering work, in which France was so long a leader, may be seen in a profusion of exquisite finishes. The artistic things the French do with the woods that they import from the East and from the American tropics are especially striking in the case of veneers cut from one burl or one section of clear-grained wood and matched to form a double or quadruple repeated pattern. Specimens of the French staining of fine woods are as brilliant as they are delicate.

As the exhibit story tells how countries differ in the degrees in which they have specialized on certain resources, so it is with the different parts of our own country. We see indicated all degrees of wisdom in caring for what we have, and all degrees of efficiency in making use of it. As the West has hardly yet recovered from the first paroxysms of felling the redwood and destroying the bison, so its exhibits turn chiefly upon the variety and excellence of its big game, its big fish, and its big trees. But the States of Washington, Oregon, and California narrow down their exhibits more rigidly either to the fisheries or to the forestry wealth of the Pacific Coast. The New York, New Jersey, and Pennsylvania exhibits, however, are the ones that show the best outcome of long contact by all kinds of interested agencies with natural resources. Man has there attained, by education and by science, the proper relation to the waters and forests and their denizens. Thus it is that we see the fruits of purely scientific investigation in the work of expert commissions. New York, exhibiting under the auspices of its fish, game, and forestry commissions, has an outdoor exhibit illustrating forestry methods. Indoors, beside the large collection of animal life, is shown what has been discovered of the relation of injurious insects to forest trees. One particularly interesting case contains models of familiar foliage and fifteen kinds of familiar insects that prey upon it in New York.

Pennsylvania records the excellence of her fish laws and her whole study of the fish-question. An instructive case is that of the birds and mammals that prey upon fish. There are several simple objects that tell a story of pressing importance to this country. They are nets and other forms of fishing devices confiscated in Pennsylvania because they are illegal or were illegally used. A fyke, a castnet, and a seine of rather small size are among the collection, and they were confiscated by virtue of the most comprehensive fish laws in this country. This law looks to the interests of both the sportsman and the commercial fisherman in contradis-

tinction to the "pirate." Consequently, it has gained great efficiency through the general approval of public sentiment. Devices that may be legal in one kind of water or at one season cease to be so in other kinds of water or at other seasons.

New Jersey's work in economic biology is illustrated by very fine studies of tree-injuring insects. But the glory of New Jersey is the mosquito campaign exhibit, a resumé of what has been done, and of what the State expects to accomplish. Briefly told, the problem is one of the draining and the filling up of the breeding-places of mosquitoes. The exhibit shows the enemies of the mosquito and how they may be utilized.

Allowing the fullest credit to the Pacific States that show their unparalleled opportunities in soft-wood production, the Southern States, nevertheless, give an exhibition of both soft-wood and hard-wood wealth that could be rivaled by few parts of the civilized world today. Kentucky, Tennessee, Arkansas, Texas, Louisiana, and Mississippi, and even the South Atlantic States, stand together in a great delegation that inevitably attracts attention to the remarkable timber wealth stored away in this large area. The exploitation of the woods of these States, especially of kinds but lately come into favor, such as the black gum, the displays of the variety of utensils, appliances, and simple implements made from these woods, besides their greater uses for furniture and vehicle manufacture and for house and ship building, assure the continued development of the centre of the South as capital continues to move into that incalculably rich section.

This forestry exhibit was made especially convincing in two forms—one, the House of "Hoo-Hoo" (which was destroyed by fire in June), a lumbermen's association; and the other, the exhibit in the Forestry Building by the Southern Longleaf Lumber Manufacturers' Association. This association has spent much money to make an attractive demonstration of the purposes for which the long-leaf pine is fit. Both in finishing and in high-class construction with Southern yellow pine, the association has given the public a lesson of the highest import. In the "House of Hoo-Hoo," one room, both the floor and wainscoting, was of pine. The wainscoting showed a veneer in which the alternate panels were pieces of the curly wood so often cut from the burls. Stained dark, this wainscoting was singularly attractive. The same construction of cypress, stained a Flemish green, had an artistic individuality; while the red, or sweet, gum, usually reserved for the most ordinary purposes, took a mahogany stain, and as a wainscoting plainly comes into the front ranks of finishing woods.

The Alaska Packers' Association, of San Francisco, besides exhibiting their mere output of a wonderful industry, has made one of the most striking shows in the building. A scenery panel, 100 feet long, shows the home of the salmon. The picture, with its rocks and waterfall, is a representation of the country about the mouth of one of the great salmon streams. The packing is shown by a set of the machines used in one of the canneries. The cleaning of the fish, the cutting of the cans, the packing and sealing, are all done by machinery. Sometimes they turn out a quarter of a million cans a day; yet, as a public-spirited agency, they sustain three hatcheries, out of which fish are taken to stock public waters on the Pacific Coast.

Broadcast over the Exposition area, some exhibits indoors, others outdoors, are the five separate exhibits by the United States Government. The United States Fish Commission and the Bureau of Forestry show lessons of supreme interest by their compact exhibits.

The Bureau of Forestry makes two displays, one an approximate demonstration of forestry practices, and the other a collection of transparencies and colored panoramic views showing all phases of the forest life and problems. Besides these, there are the mammoth bird-cage, exhibiting many of the treasures of the National Zoölogical Parks, and an exhibit made in the United States Government Building, by the National Museum, comprising part of the general Smithsonian display. Together with the bird-cage, this exhibit by the National Museum is intended for the dissemination of purely academic information, and for such purposes seldom has anything so successful been done.

The low, square, temple-like building of the government's fish-exhibit is the repository of animal forms the most curious to be found at the Exposition, and of collected records bearing upon the vast work that the government has undertaken and accomplished in the past generation in maintaining a

normal supply of its aquatic food. With the hatchery demonstration and the central pool of seals and various forms of tortoises, principally snappers, soft-shells, and terrapins, are the tanks of both fresh-water and salt-water fishes. The fine collection of live material repays all the study one can give it. What a rich resource this is!

In addition to the display of a great variety of fish-life, there are exhibits of fish-culture and related scientific research, of fishing-methods, and of the products of the fisheries. Of great interest is the statistical table showing the present annual yields of the States of the Union. It shows Virginia with the largest output in pounds (nearly four hundred millions), and, returning, next to Alaska, the largest income (more than $4,500,000). New York is next in output. Alaska, with no more output than the State of Washington (about one hundred and twenty millions of pounds), more than doubles the value of Washington's annual catch, giving an income of $5,600,000, putting that Territory in the lead over the rest of the country in the value of income from fisheries.

The science of pisciculture is shown in the now familiar phenomena of hatching fish-spawn and in other processes exhibited by the fish commission. One of the most interesting of these is the special care of lobster-fry while in the larval stage. A laboratory and houseboat combined is provided with lateral tanks in which the water is agitated by paddles, thus keeping the fry and their food on the surface of the water, and preventing the suffocation, starvation, parasitism, or cannibalism that would otherwise occur. The scientific work of the fish commission includes a model of the deep-sea investigation steamer "Albatross," the vessel that has seen more service of the kind than any boat in the world. Along with this are deep-sea fishing and collecting apparatus.

A collection of beautiful plates of the various and curious fish-fauna of the Hawaiian Islands, and a more limited number of drawings of the fish of Porto Rico, make known splendid opportunities for wealth of which only the smallest advantage has been taken.

The recent vital extension of the work of the United States Bureau of Forestry has called forth the most beautiful and wonderful exhibit of this kind that the government has ever made. An arcade, whose walls are practically made up of transparencies of two- and three-foot photographic scenes in forest lands all over the country is the principal feature of the exhibit. The scenes in the arcade on one side nearly all relate to the Rocky Mountain and Pacific Coast forests; those on the other side to the eastern half of the country. There is a splendid relief-map showing the forest distribution in the United States, and the extent to which the government has secured control or supervision over the forests.

The work of preparing and installing this unusual exhibit was done by Alfred Gaskill, of the division of dendrology, and specialist in forest investigation.

Next to preserving and perpetuating the forests that are now standing, the greatest concern of the forestry bureau is to overcome the difficulties connected with gradually foresting the treeless section. Every part of the exhibit emphasizes this fact. On the map, one sees symbols showing plantations made by the bureau. It is at once noticeable that these symbols cluster thickly in the north central part of the Great Plains region, where man most keenly feels the hardships of a lack of trees. In the outside exhibit of the bureau, there is a model plat showing how the government advises the planting of trees about western farms for windbreaks, for timber production, and for the preservation of the watersheds and the flow of streams. Jack pine and white spruce are recommended for cold northern prairies. For the semi-arid upland prairies, the mixture is green ash, Russian wild olive, and western yellow pine. In the river bottoms of the southern two-thirds of the Middle West, the model farm shows either hardy catalpa alone or mixed with black walnut, while sycamore and Carolina poplar answer for other parts of the same region. For various parts of the arid plains, a number of trees are exhibited as available. Both black and honey locusts, pines, osage orange, Russian mulberry, are found in the list. Pictorially, this part of the work of the bureau is placed before one in scenes in the West where trees have been planted along irrigation ditches, and where they would help in the protection of watersheds. The scanty forests on western slopes, so important to irrigation, but destroyed by repeated fires, the sand-hills of Nebraska that it is proposed to forest, and a scene in a part

of the West where irrigation and the concommitant tree-planting have won fertility from the desert, are sufficient to drive home the value of tree-planting in the West.

Preservation and perpetuation of forests over the country at large, irrespective of sections, is explained in as many ways as the subject of tree-planting in the West. The map shows districts in which there are State or private forests in whose management the advice of the bureau has been asked. The largest number of such tracts are in the Great Lakes region and in the East, particularly New York and New England. But the largest individual tracts are in southeast Texas, where more than a million acres are managed under government direction, and in California, where the whole of the State forest policy is being so guided. The selection of trees for forest plantations in all parts of the country is advised by actual plantings in the outside exhibit, as in the case of trees shown for windbreaks.

The American lumber operations, so immense that they are appalling, are brought to mind by two pictures, one of which shows the original condition of a Pacific Coast redwood forest, and the other the site of a forest of these enormous trees, now containing only stumps on land that is being turned into pasture.

The revelation of the genius of a people reaches no such point of vividness in other forestry and fisheries exhibits as one sees in every foot of the unobtrusive wonderland that the Japanese have put together. Of no other nation displaying resources at the Exposition is the combination of simplicity and of artistic finish in work of every description so prominent a characteristic. In the welding of this fitness and beauty to every occupation, the Japanese have achieved many results which have not been approached in the similar activities of other nations. One questions with extreme doubt whether there has ever before been brought together so astonishing a composition of the finished products from the "waste" that lies about those who cull the forest and the sea to add their resources to the material wealth of the earth. Their ingenuity in finding apparently unsuggested uses for various materials is repeatedly demonstrated. Perhaps nothing in their exhibit gives more conclusive evidence of their resourcefulness than the wood-shavings which they give a form closely simulating watered silk. This material they call chip-braid; and, made from some woods, it has a finish that easily rivals the artistic silks of special finish. It would be hard to conceive a hat more closely adapted to the esthetic and, doubtless, to the practical requirements of women than the tasteful works in millinery that are made from the more substantial grades of the chip-braid. Trimmed with actual silks, or with the more silk-like grades of the chip-braid itself, and with flowers of subdued colors made from the braid, but apparently never trimmed with feathers or birds, these hats are extraordinary examples of variation in uses of a single material. The Japanese take hold of a waste product and extend its uses to every probable application. There is no telling what they will do with any product. Its ultimate reduction to components is not to be guessed at by what is obvious to the Caucasian. The knowledge that even in this country seaweed is used as a food to a moderate extent does not prepare one for the surprise felt in coming upon the bizarre products that the Japanese turn out of this material, little valued among most other peoples. One of these is the shiny, faintly creamy *kaku kanten*, that they make from the gelidium, or tengusa, and that they put up with ribbons, and fasten together as a haberdasher fastens his wares. It appears to have less substance than the foam of the waves. In its fragile solid state, the *kanten* is compared by the Japanese to isinglass. Another seaweed having a remarkable value is the *funori*. It is made into sheets, and from this a kind of starch can be made. A paste, also, that is substituted for wall-plastering has a wide range of usefulness. It is doubtful whether any other nation has grappled more closely and boldly with the questions of actually increasing the production of natural wealth than Japan in urging the oysters to faster secretion of pearls. Cultural pearls, of less value than purely natural pearls, but entirely obliterating the merits of the imitation pearl, are among the curiosities shown. The cultural pearls are the results of introducing mother-of-pearl in round pieces into three-year-old spats. This piece of molluscan surgery is a method secret to the Japanese. After it has been performed, the young oyster is returned to the water, and for four years is permitted to add secre-

tions to the jewel nucleus introduced within its body. The exhibited specimens of cultural pearls are objects of genuine beauty.

The definiteness and simplicity of the industries that have grown out of the use of the bamboo and the coniferous trees, and of the stable products of the water, the salmon, cod, and herring, the sardines, anchovies, and mackerels, the lower life, prawns, shrimps, bivalves, and marine algæ, appear characteristic both of the resources themselves and of the methods of industry of the people who turn the resources to account. It is the clean-cut exhibit of a clean-cut people. Yet there is an ethereal element in the simplicity of it all, the suggestion of lightness and freedom.

Great as one would expect to find the development of the net and its uses by a people engaged so largely in fishing, the Japanese do things with the net that bespeak the cunning of the race. There is a picture of a jaunty party of noblemen in surroundings that would suggest tennis, who are preparing for no less piquant amusement than the snaring of wild ducks by means of comparatively small nets. These gentlemen are in the royal preserves, and standing at "passes" where the ducks will come in low flights at certain hours, they will sweep in the hapless birds as nonchalantly as the butterfly hunter rakes in a fine specimen that sails overhead within easy range. The seine for taking large schools of sardines is a study for the fisherman. Taking advantage of the schooling of the sardines, and the tendency of fish in schools to keep away even from an obstruction which singly they could pass, the Japanese make the long wings of the net very coarse-meshed, the openings in some cases being almost a foot across. By parallel drawing of the wings, the fish are kept headed in the direction of the small-meshed bag. The advantage consists, of course, in the greater lightness attainable for the wings where the mesh is so coarse, and the consequent opportunity to lengthen the wings. Such nets are made several hundred yards long, and extraordinarily large schools of fish can be surrounded.

Germany is the home of forestry as an exact science. One of the simplest illustrations of German methods, yet likely to arrest attention because it is curiously made, is a model comparing a grove of evergreens in a natural state of denseness with a slightly thinned stage of the same sort of grove, and with a much-thinned condition. The model is eloquent of the inherent German tendency, the desire for neatness and particularity. The little model has that quality that we define as "Dutch" when we see a garden too stiff and lacking in unstudied effects of beauty, but it forces us to recognize the German as a resolute reducer of the number of forest trees when it is to the interest of increased production.

Every step of one's way through the exhibit adds to the idea first received—that the German looks upon trees as marketable products, things that he can shape and regulate as successfully as the farmer cultivates the most ordinary crops. He studies the whole history of trees, continually applies observations at this point and at that to produce desired ends, and behold, he has the output of trees at his command! How many ways the German has contrived for acquiring this mastery is shown by maps, models, charts, and other means. Perhaps we are most struck with the perfection and variety of instruments for scientific foresting, such as the many kinds of calipers for obtaining trunk diameters, the assortment of hypsometers for determining the heights of trees.

The majority of visitors will doubtless be surprised to find that plow, harrow, and seed planter are made for especial use in the forester's work, and that the whole business of forestry is on so secure a basis that emergencies in sowing and caring for a crop of trees are met with the same consideration that the progressive farmer gives to his work, and call for the use of such devices as the steam-plow in breaking up barren ground on which trees are to be sowed or set out.

The model of a German forest-fire tower will be explained by the forester in attendance as a building considerably more than a hundred feet high, and, therefore, well above the level of even the coniferous trees. It is built like a minor coast-light, a little room on the top of a scaffolding. Connected with it is a system of semaphores, while the various towers have communication with one another through an indicator that records in each tower the location of a fire. This fire system suggests how well the German knows his forest topography and resources. It has all been estimated and mapped most accurately.

What could be more exact than the map of middle and north Germany to show the comparative forest areas and the relative abundance of the species in the forest districts? One sees from this map not only the relative forested area in every section of the middle and northern part of the empire, but he learns, by colored surfaces, in just what proportion oak stands to birch, beech, or fir, and the relation of every one of these others to the whole, and to its parts.

Maps show the history of certain government reserves for more than a century past. The gist of this story is that a definite plan has been followed to give a rotation of crops, so that where oaks stood during the Franco-Prussian War there may have been beeches in the Crimean War. Such practices have had as an important object the restoration to the soil, by the planting of one tree, of certain elements that had been taken out by another.

Besides showing what she has accomplished in practical forestry, Germany displays her genius for working toward results by long series of experiments. Tireless investigation is exposed in the map that explains the situation of meteorological stations throughout the forests of the empire. The aim of the study is to determine the effect of increased tree-planting on atmospheric conditions of moisture and temperature, and so by reaction on the trees themselves.

Two minor phases of the fish, game, and forestry exhibit that are attractive to a very large number of persons are the booths of COUNTRY LIFE IN AMERICA and other magazines devoted to kindred interests, and the pictorial exhibits made by North American railways penetrating unusually beautiful parts of the country. Exhibits of this kind impress us with the scenic splendors and the natural riches of our continent. Particularly instructive is the relief-map of the proposed Appalachian Park, in the United States Forestry Bureau exhibit. This park, while intended primarily to insure protection of the watersheds having their origin on the high mountains of North Carolina, would do more to draw men and women of a large part of this country to nature, and her problems and attractions of every kind, than any single similar act in which this government has interested itself.

THE PHILIPPINE PEOPLES

THE VILLAGES OF TRIBES, THE SOLDIERS, THE PRODUCTS OF THE ISLANDS, THE INDUSTRIES OF THE PEOPLE—THE PROBLEMS OF GOVERNMENT AND DEVELOPMENT PRESENTED AND ILLUSTRATED IN A REMARKABLE WAY

BY

ALFRED C. NEWELL

PERHAPS the most instructive part, and surely one of the most interesting parts, of the Fair is the Philippine Reservation. It shows the condition of the savage tribes; it shows the most advanced civilization; it shows what the United States has accomplished during its rule of the archipelago; and it shows the nature of the Philippine problem in all its phases.

It is the largest exhibit at the Fair, and covers forty-seven acres of rolling woodland. The approach is picturesque. Bounding the reservation on the north is Arrow Head Lake, a wedge-shaped body of water, whose southern shores are dotted with bamboo huts and houses—the homes of Moros, fierce river pirates of Luzon. Gay red flags flutter over the villages, and cumbersome boats sway at rope moorings. Three bridges span the lake. The centre one is a massive stone reproduction of the Bridge of Spain, which crosses the Pasig at Manila. It leads directly to the Walled City, an imitation of the fortifications erected by the Spaniards three hundred years ago, to repel Dutch and Chinese invaders. Its walls have a green moss coating. Old Spanish guns are mounted on the parapets. Inside the walls is a court

containing war relics of all the Philippine campaigns. The fortifications are also accessible by two bamboo bridges.

Once across the bridge and through the Walled City, you face the reservation, which is like a scene in Manila. The buildings are arranged in two groups. In the centre of the first is a tall stone shaft, similar to those seen in public squares in Spanish cities. To the right is the Fish and Game Building, built of bamboo and nipa, the leaves and bark of the latter being used for thatch. Specimens of the wild buffalo, water buffalo, and wild boar are shown. There are a thousand specimens of fish common to the Philippines. Giant clams, from the southern islands, with shells five feet wide, may be seen. These clams, which are frequently embedded among the mother-of-pearl mollusks, often cause the death of pearl-divers. On the shores of the lake are bamboo fish-traps.

On the other side of the Plaza is the observatory, patterned after the one at Manila, from which timely warnings of the dreaded typhoons are sent to Japanese and Chinese shores. It contains a microseismograph, or register of earth tremor, which gives warnings of earthquakes. This delicate instrument was made at the Manila Observatory by native Filipino mechanics. North of the observatory is an outdoor relief-map of the Philippine Islands, 110 feet long and 75 feet wide. It was made by Father Algue, the Jesuit who keeps the observatory. From the high board walks which surround the map a good idea of the sixteen hundred islands of the archipelago may be obtained. One sees the islands as from a low balloon.

THE PLAZA SANTA CRUZ

The Plaza Santa Cruz is the centre of the reservation, and is a reproduction of a corner of Manila. In the middle of it, an imposing statue of Magellan, the discoverer of the Philippines, surmounts a drinking-fountain.

There are reproductions of the Manila Cathedral, brown and square, the Government Building—after the style of a Spanish palace—and a model of the residence of a wealthy Filipino. Seated in this square, the visitor may take in at a view the several stages of Filipino development. In the native huts, on the wooded hillsides, are the naked Igorots and Negritos; to the north the Moros disport themselves in Arrow Head Lake; in the buildings that face the square are the products of Filipino looms and hand-work; the pictures and sculpture from Filipino studios, and, best of all, compositions, drawings, and hand-work from Filipino schools. And, back of the reservation, the American Flag floats over the camps of the Filipino scouts and the constabulary.

EDUCATION

The first American army of occupation in the Philippines contained teachers as well as soldiers. Education followed the flag wherever it was carried. The first people to teach English on the islands were officers and enlisted men in General Merritt's forces. The result of educational work is summed up in the statement that more persons speak English in the islands today, after three years of American rule, than spoke Spanish in the four hundred years of Spanish rule.

The educational exhibit tells the whole significant story. Here will be found exhibits, ranging from blocks of wood turned in the Moro Industrial School at Zamboanga, where naked little savages are taught their A B C's, to essays by the students of the Manila Normal School, where Filipinos are taught to teach.

When the American troops entered Manila on August 13, 1898, there were less than 800 schools on the islands. Today there are 2,900 schools, with more than 200,000 pupils. There are 3,000 Filipino teachers in these schools, and more than a thousand American teachers. English is taught and spoken everywhere. In many of the compositions shown in the exhibit the pupils show an apt knowledge of English. The Spaniards encouraged the natives to speak only their dialects.

Work with the hands has been incorporated into the public schools. There are hundreds of examples of wood-turning, carving, painting, embroidery, basket-making, and weaving by the pupils. At the Insular Trade School, at Manila, boys are taught useful trades. The exhibit of the Schools of Agriculture, recently established at Negros and elsewhere, shows that the Filipino is willing to turn from his primitive methods of farming to modern means of tilling the soil.

A MODEL SCHOOL

But more impressive than these exhibits is the model school conducted by Miss Pilar

Zamora, a Filipino graduate of the Manila school. The school-house is a bamboo and nipa cottage, built like a bungalow. Here every day come twenty little Filipinos, recruited from the various villages on the reservation. They sit at desks built in America. The blackboard on which they crudely fashion their English letters is hung on bamboo poles. English composition, geography, and arithmetic are taught.

One of these pupils is Antaero, an Igorot boy, aged twelve. I had seen him among his own people, wearing only a breech-clout, dancing the joy-dance of his tribe, with the sunlight gleaming on his copper skin. Yet, at school he wore a coat. He is the only one of the Igorots at the Fair who can speak English. He went to an American school in Luzon two years. His face is keen and bright, and his eyes have a merry sparkle. Clad in Western clothes, he would look like a dark American mulatto.

"Did you like to go to school in the Philippines?" I asked him. "Yes."

"Do you want to go back to school there?" "Yes."

"What are you going to do when you are a man?" The boy hesitated. His people were just then beating their brass instruments, as they whirled around in a dance.

"Would you like to teach school?" I continued. "Yes."

"Would you then wear clothes like these I wear?" With a laugh, Antaero pointed to the breech-clout and said: "I like to wear string-breech." String is what he called his clout.

American teachers who have lived in the Philippines believe that the Igorots, who comprise one-eighth of the 8,000,000 inhabitants of the islands, can be emancipated from savagery.

FILIPINO ART

The educational exhibit is only part of the display made in the Manila Cathedral. As you enter the building, you are confronted by a statue of Rizal, the Filipino leader who was assassinated by the Spaniards. It stands on a high marble pedestal, and is a noble figure. It is the work of Isabela Tampinco, a Filipino sculptor. Flanking the statue are numerous busts and wood-carvings, the work of Filipino artists. In the rear is a massive shrine with a tall crucifix.

But the most interesting art display is in the Government Building, on the reservation, where there is a gallery of paintings. As you enter, the most striking picture that greets the eye is an allegorical painting, twenty by fifteen feet, representing the Philippines—a lovely maiden, holding out the olive-branch to Columbia, who is surrounded by angels, representing the arts and crafts. This painting is the work of Resurreccion Hidalgo, a noted Filipino artist, who was paid 25,000 francs by the Philippine Government Board for this picture, which will be hung permanently in Manila. Another Filipino artist, Luna, whose brother was killed in a rebellion against the Spaniards, is represented by numerous pictures. The best is that of a nude woman. There are some excellent examples of wood-carving in this gallery.

A LEADER'S VIEWS

I met here, in his office in the Philippine Government Building, Doctor Leon Guerrero, who was a member of Aguinaldo's cabinet, and is one of the most prominent Filipinos in the islands. When I asked him, through an interpreter, what would be the effect of the Filipino display at the Fair upon his own people, he said:

"It ought to stimulate them to new energy in developing themselves and the islands. Every Filipino here should be a missionary of civilization when he goes home."

"What has done most to help your people?"

"The schools started by the Americans."

Then he continued: "What we are eager to get is a closer commercial relation with the United States. We want the tariff reduced so that we may export our hemp to the United States, instead of to Germany. We want American capital to establish manufactures. We have native inventors who need only capital to exploit successful inventions. For example, a Filipino recently invented a machine to extract hemp fibre. But we don't want combinations of capital, such as your trusts." As he spoke of trusts he smiled.

When I asked him if he thought there would be more resistance to the Americans, he said "No."

"What is the attitude toward Aguinaldo?" I asked.

"All Filipinos have respect and sympathy for one who has been their leader," he said.

A MORO VILLAGE

A picturesque part of the Philippine reservation

Before leaving, I asked: "Do you think the Filipinos are capable of self-government?" Doctor Guerrero paused a moment. Then he said: "If the government of the United States expects to make an Anglo-Saxon of the Filipino, it will be a long time. If taken as they are, as Filipinos, I mean, they are capable of governing themselves—now."

Doctor Guerrero is one of fifty prominent Filipinos who are now in the United States as guests of the Insular Government. He is also a member of the Philippine Exposition Board. They have been received by the President, and have visited our principal cities. In a way, they are envoys sent from the Philippines to get impressions of the United States to take back to their own people. This is really part of the educational work that is being accomplished by the Filipino exhibit at the fair.

AGRICULTURE

Hemp, the principal product of the Philippines, forms, in all its stages of growth and treatment, the chief exhibit in the agricultural building in the reservation. The crop last year was worth $20,000,000. The agricultural building is built of bamboo and thatched with nipa. Long festoons of hemp hang from the rafters. Some of the hemp, specially cultivated, is as fine as silk. This, woven with silk by natives, makes a very attractive kind of goods called jusi. Very little machinery is used in the culture of hemp.

THE HOME OF AN IGOROT

Heavy wooden combs, used for refining the fibre, are shown. The hemp is transported in bull-carts with wooden wheels. The exhibit of Filipino plows shows a crude implement. The plowshare is molded in stone molds, and is fastened to heavy timber. There is only one handle to the plow. Deep furrows are not required for hemp.

Three hundred varieties of rice are shown. Rice culture is very profitable. It is the chief

A TREE HOUSE OF A LANAO MORO

article of food, and the cost of labor is very little. The laborers on Filipino farms receive about fifteen dollars a year.

Cotton grown on trees fifty feet high is a feature of the agricultural display. These cotton trees are peculiar to the Philippines. Copra, from which cocoa-oil is extracted, is plentiful. A large tobacco exhibit shows a product that is exported to Spain, China, and India in large quantities.

In the bamboo mines building, illustrations are given of the crude methods employed by the natives of northern Luzon in extracting gold from river bed-rock by crushing the ore between large rocks and washing out the gold deposit. Gold is found in many parts of the islands. The deposits have not been extensively worked, however.

Samples of copper ore from the province of Lepanto show valuable copper deposits. The mineral resources of the islands are almost wholly undeveloped.

FORESTRY

Among the natural resources, timber takes a prominent place. There are 48,000,000 acres of forestry. In the forestry building, which is really an enlarged native house, made of Philippine woods and thatched, and with a long veranda of bamboo, shaded with coils of rattan, are more than fifty specimens of hard wood. The most valuable is narra, which is of delicate grain and is susceptible of a finish more beautiful than rosewood. It is often mistaken for mahogany. Among the other native woods are molave, which is yellow and hard, and ebony, which is exported in large quantities for fine furniture.

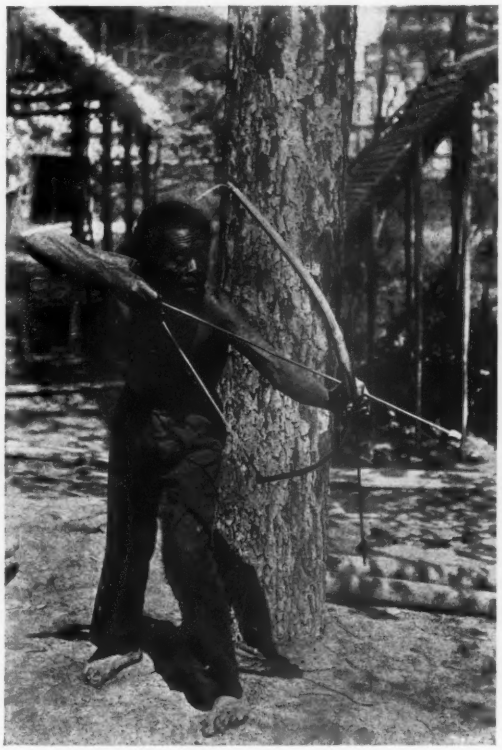
One section of the forestry exhibit is given up to gutta percha and rubber, of which an annual importation to the value of more than $20,000,000 is made to the United States since 1892. Nearly all the gum chicle, used in the manufacture of chewing-gum, in the United States, comes from the Philippines. The amount exported last year was 4,500,000 pounds, and was valued at $1,500,000.

The Commerce Building, which faces the Plaza Santa Cruz and which is a reproduction of the preliminary Philippine Exposition held last year in Manila, contains both imports and exports. The principal exports are cigars and straw hats, and the leading imports are cotton cloth and canned goods. Copra, or dried cocoanut meat, which is exported in great quantities to France, where it is made into soap, may be seen in large cases. It looks like mushrooms.

WOMEN'S WORK

In sharp contrast with the almost primitive methods of farming and mining is the work of the Filipino women in the Manila Building. This building has oyster-shells instead of glass in the windows. They are split into transparent layers, and keep out the heat of the sun but let in the light. In this building is displayed woman's work of embroidery, weaving, silk garments, and elaborate wood-carving.

A group of Manila women show a large American flag woven of many small pieces of colored cloth. Matting, woven with many designs, is another example of their handiwork. In this building may be seen a round narra table, seven feet and nine inches in diameter. It was presented to Governor Taft at Manila. An old-fashioned bed, with four posts handsomely carved, is the exhibit of a group of Luzon women. These exhibits by groups or societies of women show a new spirit among the natives. They were eager and proud to make a showing of their work at the Exposition.



THE FILIPINO OF YESTERDAY
A Negrito, one of the aborigines of the Philippines

AND OF TODAY
A Pilipino scout, trained by American soldiers

ETHNOLOGY

West of the Government Building, and overlooking the Moro village, is the Ethnological Building, a low edifice with cloisters like a convent. In the centre of the courtyard is a tall tree, and perched among the branches is a bamboo house, the home of a Lanao Moro. Many of these Moros live in tree houses. They are the lowest order of the Moro tribe. Originally, the houses were built in the trees, to escape from wild animals and enemies, who could be more easily resisted in the air than on the ground.

The ethnological exhibit, collected and arranged by Doctor Albert E. Jenks, Chief of the Ethnological Survey of the Philippine Islands, is an explanation of the habits and life of the best known Filipino tribes. The lower floor is devoted to the Igorots and their various sub-tribes, the Moros, and the Negritos. The Igorots and Moros are of Malay extraction, but the Negritos, the aborigines of the islands, are a puzzle. They are very small, and exist by using the bow and arrow.

One Igorot exhibit occupies the north wing. These are the head-hunters. Their head-hunting axe is somewhat like an American hatchet. Instead of the blunt side, there is a dull point, to be driven into the victim's skull. Then the head is chopped off. Among the Mindoro Igorots, a native who has cut off twenty heads is allowed to wear on his forehead the beak of a horn-bill, dyed

crimson. One of these beaks is displayed in a case.

The Igorot wears no clothes. As a substitute for pockets, he wears a pocket-hat, with a circular straw crown, which he fastens to the back of his head. More than a hundred of these hats may be seen. Elaborate head work by the Bogobos shows a primitive color sense, like that of the American Indians.

A NEGRITO BOY SHOOTING AT A COIN

He is the best shot with bow and arrow on the Philippine reservation

The Igorots, who are an agricultural people, make scarecrows of straw, and several of these may be seen in this building.

The work of the Moros shows the Spanish influence. While the Igorots expose their bodies, the Moros use breastplates made of the horn of the carabao and linked with a brass chain. The exhibit of Moro weapons includes the kriss, a shining curl of steel—a very wicked looking weapon. There are a hundred or more bolos, a short sword formed like the Cuban machete, and used for hacking rather than thrusting. The Moros show skill in making hammered brass boxes and crude musical instruments, weaving gay blankets and making inlaid silver handles for their knives.

The implements and weapons of the Moros are better in workmanship than those of the Igorots. The Moros are lending themselves less readily to the way of the American. It is believed in many quarters that the assimilation of the Igorot men, the head-hunters, will not be difficult, but the assimilation of the Moros as a race will be impossible.

MORO VILLAGES

But far more impressive than the display of their weapons and implements in the

Ethnological Building is the living exhibit of the natives themselves. They are grouped in tribes about the reservation. Different from these are those who live on the shores of Arrow Head Lake. On the east of the Bridge of Spain, and occupying a neatly arranged village of thatched bamboo houses, which extends down to the water's edge, are the peaceful Visayans, who are more artistic than any of the other Philippine natives. They are agricultural, fond of music, and have many members in the various companies of scouts. In their village is a market-place and a theatre. The first brass band organized on the islands after the American occupation was composed of Visayans.

In contrast with the gentle Visayans are the fierce Moros, the dwellers on the shore on the west side of the main bridge. There are three tribes of Moros. Two of them, the Samal and the Lanao, are deadly enemies, and an armed guard is maintained between the villages.

DANCE OF THE IGOROTS
A daily sight on the Filipino reservation

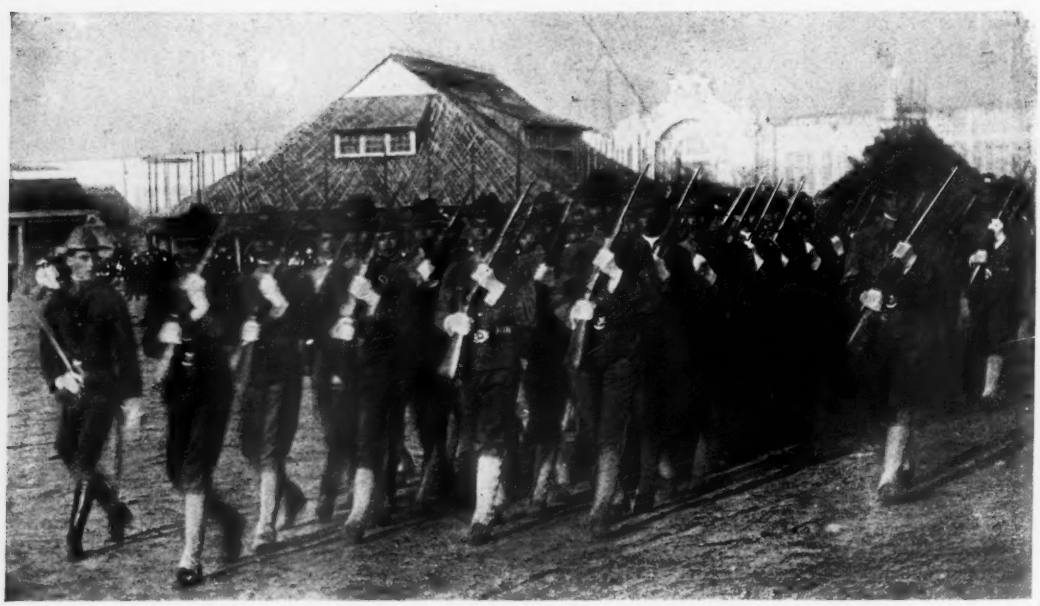
The Samal Moros are the most intelligent inhabitants of the Island of Mindanao. They are sea- and river-rovers. Unlike the inland Moros, who have sultans, the Samal tribesmen are ruled by Rajah Muda Mand, whose brother (who is also Prime Minister) is at the

ANTAERO
The only Igorot at the Fair who speaks English

head of the Samals at the Fair. He is stately and bronze-hued, wearing the turban of a Mohammedan. All the Moros are followers of Mohammed. The Rajah's brother receives visitors on the porch of his bamboo house with fine courtesy, and touches his turban when they go. His rank is that of datto, or headman. Like all the Samal Moros, he has become a stanch ally of the United States. On the porch of his house is a row of what look like brass kettles. They are musical instruments, which are beaten with sticks by Moro girls, giving forth a crude, weird sound. The datto's house is the only one with a piazza. Near his house is raised his private flag—two blue bars on a white field. The datto's brother, the Rajah, has traveled in Europe with a retinue, and was entertained by Queen Isabella of Spain.

The Lanao Moros are the tree-dwellers. Like the Bogobo Moros, they are an inland tribe. The Bogobos wear more clothes than the Samal and Lanao Moros. They are expert bead-workers, wear multi-colored beads, and are the most pompous of the native tribes. They occupy a village of nipa huts beyond the Lanao village. On the road between the Samal and Lanao villages at the Fair is a sign bearing this inscription:

"Persons photographing the Moros do so at their peril."



THE FILIPINO CONSTABULARY ON DRESS-PARADE

THE JAPANESE BAZAAR AND THE HEADQUARTERS OF THE IMPERIAL COMMISSION

THE JAPANESE TEA-HOUSE, FRONTING ON THE LAKE

Since the Moros are Mohammedans, it is a violation of their religion to have their pictures taken.

The Moro villages are marked by gay red flags. They differ from ordinary flags in that they run the entire length of the pole, and instead of flying from ropes are attached directly to the staff. Many Moro boats are on Arrow Head Lake. Some have red-and-white sails, like craft on the Nile. The Moros show great dexterity in handling them.

THE NEGRITOS

Near the eastern edge of the reservation is the Negrito village. Here are fourteen of the island aborigines, small, black people, amiable and cordial to visitors. They can subsist upon roots and herbs. They still use the bow and arrow. The Negrito children show wonderful skill. One of their favorite pastimes is shooting at five-cent pieces, which are furnished by visitors. The five boys in the village join in the contest. They shoot at a distance of twenty feet, and one of the smallest, aged seven years, is the best marksman. Most of them have learned to say "Thank you." Their skill with the bow and arrow was put to practical use in June.

ENTRANCE TO THE JAPANESE SECTION IN THE PALACE OF VARIED INDUSTRIES

Sparrows infested the gardens of the Fair to such an extent that the Negrito boys were set to killing them with their arrows. They rarely missed a bird. There are less than 10,000 Negritos left on the islands, and it is believed that they will be extinct before a half-century. Although the most primitive of the islanders, they are not slow to adapt themselves to civilized ways. You may see a dwarfish Negrito woman sitting in the doorway of her bamboo hut, sewing with an American needle, a pair of American scissors at her side.

THE IGOROT VILLAGE

Across the road from the Negrito Village is the Igorot Village, the largest of the native settlements. On account of their dog-eating habit, they have been much talked about since the opening of the Fair. In this village are the Bontocs and Suyoc Igorots, and the Tinguianes. The Bontocs are the head-hunters and dog-eaters, the Suyocs are miners, and the Tinguianes are lowland agriculturists. The Bontoc Igorots are copper-colored, with good physical development. They have high cheek-bones, thick lips, and wear their straight black hair over their shoulders. Every man has a pocket-hat fastened to the back of his head. As these men walk or dance there is a fine display of muscles. Their only apparel originally was a breech-clout. Subsequently they were compelled to wear short silk breeches.

The Igorots have learned the value of money. A visitor stopped at a bamboo hut and offered an Igorot child a penny. The little one threw it to the ground. The visitor offered a five-cent piece, and the child accepted it. The Spaniards used silver almost exclusively, and the natives regard it as the only metal of value. All the Igorot men, women, and children smoke cigars. They seem to be continually smoking. The best way to study these people is to take a number of cigars to the village and give them to the savages. They carry cigars in their hair or over their ears.

Tattooing is common among them. A man's war record is tattooed upon his breast. Antonio, the lithe chief of the Bontocs, who is a very amiable savage, has five heads credited to him on his breast in marks of red and blue.

JAPANESE COSTUMES OF THE MIDDLE AGES

THE LAKE IN THE JAPANESE GARDENS

One of the most restful spots at the Fair

THE GATEWAY TO THE CHINESE PAVILION
The Pavilion shows in the rear

In the centre of the Bontoc village is a stone fireplace, which is the shrine of the tribe. Here they prostrate themselves to the sun every morning, and here they have their dog feasts. The dog is considered a special delicacy. They first bind the dog to a stick. Then its throat is cut while the tribesmen mumble something. It is then skinned and roasted.

The Suyocs wear short coats, but their legs are bare. In cooking, they use crude copper vessels, which they make. They have industrial traits, but barbaric instincts. Of a peaceful nature are their neighbours, the Tinguianes, who spurn the dog-meat of the Bontocs. They show a rude architectural skill in the construction of their bamboo and nipa huts. These have small balconies in front, on which the women sit and weave.

PHILIPPINE SOLDIERS

If you leave the Igorot Village just before half-past five o'clock in the afternoon, you will hear a bugle; and, if you climb the short hill to the parade-ground, you will see emerging from the huge barracks called the cuartel 200 khaki-clad Filipinos. With heads erect and swinging stride they hold a dress-parade. The American flag waves over them, and a Filipino band of eighty-five musicians plays patriotic music. These men are a battalion of native constabulary, the native police, organized to keep the peace on the islands. They are selected from the various provinces and tribes. As they form in line, it will be seen that nine wear red fezes instead of the regulation campaign caps. They are Mohammedan Moros, whose religion does not permit them to wear the ordinary head-dress. When the constabulary were recruited among the Moros, the American army officers, who organized the body and who still command them, agreed that none of the religious customs should be interfered with. The constabulary on the islands number 6,000. They have distinguished themselves in campaigns against native outlaws, and have suppressed brigandage.

Hardly have the constabulary marched from the parade-grounds, when another bugle sounds, and, on a stretch of level turf behind which rise the tents of a military camp, march the Filipino scouts, clad in the

IN THE JAPANESE GARDENS

A model Japanese house with dwarf pines in front

DAS DEUTSCHE HAUS
is the inscription over the German Building. A replica of part of the Emperor's castle at Charlottenburg

regulation United States blue, with service forage caps and with a Filipino band playing. These are the picked representatives of a

CANADA'S REPLICA OF THE PARLIAMENT HOUSE AT OTTAWA, DONE IN CANADIAN GRAINS

THE ROBERT BURNS COTTAGE
Erected by the Caledonian Society, of St. Louis

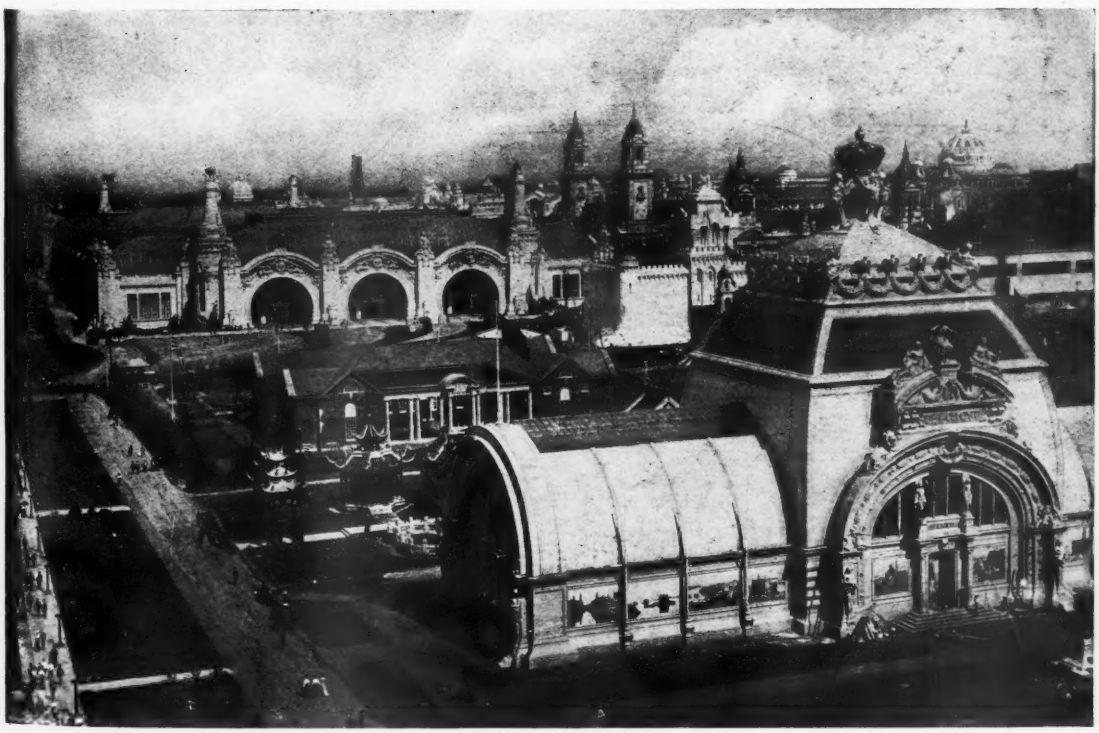
brigade of 5,000 native soldiers, whose mettle was tested during the insurrection, when they remained loyal to their oath of allegiance to the United States and fought their own countrymen. This efficient organization has grown from a band of scouts that led the way for General Lawton through Luzon jungles. They, too, form in line to salute the Stars and Stripes. It is an impressive sight—this long line of Filipinos in blue, stretching down the green parade-ground at sunset. It shows the real work accomplished in the Philippines—the bringing of law and order and discipline out of insurrection and ignorance—the lesson of good government.

HOW IT WAS DONE

When the Philippine Government was invited to take part in the St. Louis Fair, Secretary Taft, then Civil Governor of the islands, realized that the opportunity had come to display to the people of the United States the resources of the islands. He called a meeting of governors of all the provinces. Some were American; some were

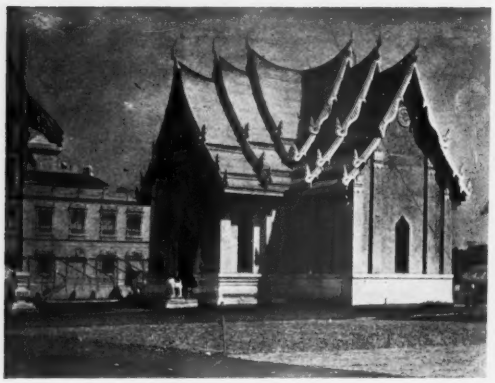
A VIEW OF THE BRITISH PAVILION
A reproduction of the Kensington orangery

THE ITALIAN NATIONAL PAVILION



IN THE FOREGROUND IS THE BELGIAN PAVILION, SUCCEEDED BY THE CHINESE AND THE BRITISH, WITH THE PALACE OF TRANSPORTATION IN THE DISTANCE

THE BRAZIL BUILDING
The tallest and one of the largest of the national pavilions



THE SIAMESE PAVILION
The second erected by Siam at any World's Fair. It contains exhibits from the Bangkok Museum

WHERE THE SINGALESE SERVE TEA
The Ceylon national building is a tea-house

Filipino; all joined heartily in the plan. Governor Taft appointed a Philippine Exposition Board. At the head was Doctor W. P. Wilson, director of the Philadelphia Commercial Museum, and with him are associated Doctor Gustavo Niederlein, who had large experience with colonial exhibits at the World's Fair; Pedro Paterno, who was president of the Senate under Aguinaldo, and Doctor Guerrero. Thus representatives of the people who had rebelled against the United States were allied with Americans to show what had been accomplished in the

A GERMAN STREET
A picturesque corner of the Tyrolean Alps

pursuits of peace. Doctor Niederlein was charged with collecting the exhibits in the Philippines and with installing them at the Exposition.

But collecting an exhibit from more than a thousand islands, populated by a hundred different tribes, all speaking different dialects, was no easy matter. The Exposition Board set about its work systematically. It was decided to hold a preliminary exposition in Manila in 1903, which would assemble all the exhibits. Circulars were prepared in the

ONE SIDE OF THE INDIAN RESERVATION
Homes of various tribes with the Pawnee lodge in the centre

native dialects and sent to the different provinces. Diplomas were awarded to natives who made exhibits. School-teachers in remote districts coöperated. Scientists, who came over from the United States, classified native woods and mineral products. A competition was started among native architects for designs for the exposition buildings. Business men joined in the movement to make a display that would give to the western world a new impression of the Philippines. All the while agents of the Exposition Board were working among the tribes, arranging for representatives at the Fair. Some of these agents penetrated mountain fastnesses, accompanied only by guides and interpreters.

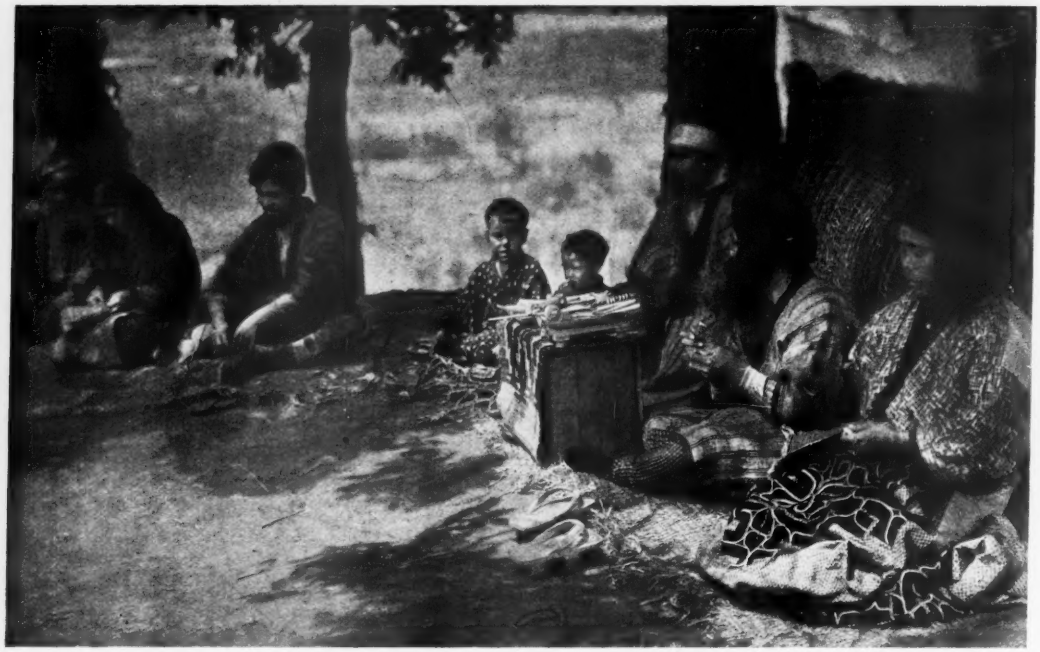
Others went to parts of the islands hitherto unexplored, and, in their work for the Exposition, secured data of definite ethnological value. In all sections of the Philippines there was fruitful activity.

When the Manila preliminary museum was opened, on Washington's Birthday, last year, more than 5,000 exhibits, many of them including hundreds of specimens of work or products, had been collected. Since that time many have been added, until the total number of catalogued exhibits is more than 70,000. The whole exhibit cost more than $1,000,000, and all but $200,000 has been paid by the Insular Government. As chief of the Bureau of Insular Affairs, which is the clearing-house in the United States for the Philippine Government, Colonel Clarence R. Edwards, U. S. A., has given the Philippine display his personal attention from its inception. Mr. Edmund A. Felder is the executive officer of the Philippine Exposition.

Thus the American people may make a thorough study of the Filipinos, from savages to educated teachers and artists. The whole industrial and agricultural resources are set forth. The natives have displayed pride and enthusiasm in the work. They have showed too, that they are ready and willing to adapt themselves to our civilization and our culture.

THE SKIN TENT IN WHICH THE PATAGONIANS LIVE

HAIRY AINU, THE ABORIGINES OF JAPAN, AT THEIR HANDICRAFT



JAPAN'S EXTRAORDINARY EXHIBIT

A WONDERFUL DISPLAY THAT TELLS THE MOST REMARKABLE STORY OF COMMERCIAL AND INDUSTRIAL ACHIEVEMENT IN MODERN HISTORY

BY

ISAAC F. MARCOSSON

WHILE the Japanese soldiers and sailors at the front use the latest inventions of warfare, their countrymen at the Exposition are exploiting the arts of peace. The Japanese exhibit tells the whole story of the empire's development with a chapter of industrial achievement and commercial expansion in every building.

"I can't lose sight of the Japanese flag, and wherever I turn I see a Japanese exhibit," said a visitor after a week's inspection of the Fair. Wherever the flag of the rising sun flies there is a polite Japanese who has something to show and something to say about it. The Japanese were the only foreign exhibitors who were ready when the Fair opened, because they planned their exposition campaign with the precision of a large business undertaking. Nearly every stick of wood used on their exhibits was brought from Japan, and was put up by Japanese laborers.

The history of the exhibit is significant. When the Japanese Government formally accepted the invitation to take part in the Fair, the belief was, even then, that war with Russia was inevitable. Other nations might have declined in the face of a costly war, but with a characteristic spirit of commercial enterprise and national pride they decided to make a display at St. Louis which should reveal to Western civilization the social and economic progress of the people. The Imperial Government appropriated $800,000 for a national pavilion. But that was a small part of the task. The business firms of the country clamored for representation, and they have made exhibits in a way that is typical of the people.

THE NEW BUSINESS SPIRIT

In every city and in many of the smaller towns of the empire chambers of commerce and associations of business men have been formed to create new industries and to foster and protect old ones and to export products wherever possible. They have coöperated for the extension of the national commerce. The product of this allied industry, therefore, is the Japanese exhibit at St. Louis, the result of a manifestation of Japanese character which must be reckoned with in the struggle for the commercial supremacy of the Far East.

Every Japanese exhibitor at the Fair, from the rich Tokio manufacturer and ship-owner to the modest carver who puts a lifetime of effort in a single piece of work, is a member of the Japan Exhibit Association. This association is an example of the new Japanese business spirit. A week after the government decided to make a display at St. Louis a meeting of representatives of all the commercial associations of the empire was held at Tokio. A business organization was made whose objects were to consolidate the exhibits and to provide a fitting appointment for them. The government appropriated a sum out of the Fair budget to assist the association in its work. Representatives of the associations were sent to St. Louis, and fully a year before the Fair opened, in every quarter of the empire, men and women were working to make and to collect the exhibits.

There are two kinds of exhibits—those made by chambers of commerce or allied business interests, and individual displays. Take, for example, the display of the Kioto Chamber of Commerce. It is a model Japanese house in the Varied Industries section, and known as the Kioto salon. The wood and bamboo was grown in the Kioto province; it was built by Kioto workmen; it was decorated by Kioto artists and furnished by Kioto merchants. It is Kioto's resources epitomized. Take the exhibit of the Association of Colliery Owners of the Provinces of Bozen and Chikuzen. It represents a capitalization of $2,000,000, and fifty mines. It shows specimens of its ore and twenty pictures of the largest collieries. The objects of the organization are to promote the mining industry, to improve trading and transportation facilities, and to publish statistics. Wherever you go in the Japanese sections you find these examples of business coöperation and the desire to display attractively and completely the nation's resources.

TRANSPORTATION

The best way to see the Japanese exhibit is to follow the various sections in the regular order of the buildings in which they are displayed. As good a plan as any is to begin at the Palace of Transportation. The Japanese transportation exhibit occupies the whole southwest corner and extends 200 feet down the main aisle.

The scope of Japan's transportation and communication service may be seen on the relief-map of the empire, 100 feet long, which is in the centre of the section. Fifty years ago such a map would have shown only the public highways over which the men drew the jinrikisha—the two-wheeled cart. There were no railways and no telegraph or telephone lines. But this map now shows a network of railways and wires, connecting thousands of post-offices.

Commodore Perry carried the first telegraph instrument to Japan in 1852, but it was not until 1869 that the first telegraph line was put in operation. It was worked by experts sent from England. The natives looked upon the line with superstitious fear and tore it down. It was necessary for the government to guard it. Today, as shown by the relief-map, there are 60,000 miles of telegraph, over which 1,600,000 telegrams were sent last year.

Twenty years ago, when the natives heard an American locomotive whistle across the bamboo stretches, they fled in alarm to the woods from the monster. The first line was eight miles long. The total railway mileage in Japan is now 4,026 miles. The capitalization of the railroads is $160,000,000. One-third of the railroads are owned by the government. Nearly all the 1,350 locomotives were made in England and the United States.

One of the most significant things explained by the relief-map is the wonderful growth of the postal service. Until 1871 letters were rare in Japan. In the feudal days only the lords were able to communicate with each other, by using scores of their retainers. As late as 1870 messages were carried from city to city by runners selected for their speed and endurance. But as soon as they acquired a Western postal service it grew with amazing rapidity. There are now

5,097 post-offices in Japan—or one for every 8,873 people. The postal exhibit includes uniforms of the Japanese postmen, who last year delivered 816,000,000 pieces of mail of all kinds. The development of the postal service has meant an important economic advance, as is shown by the exhibit of the work of the postal savings banks. At every post-office is such a bank, where savings-stamps ranging in value from one cent to fifty cents are sold. Thousands of school-children are among the depositors, who now number 2,000,000 and whose total deposits aggregate $11,000,000. But the postal service has gone a step further in public education. Through it thousands of papers and magazines are sent every year to the interior agricultural communities, and traveling libraries are enabled to reach many people. Nothing is more typical of the general advance of the Japanese people than this exhibit of its transportation and communication.

Alongside the relief-map of the empire is a relief-map of Formosa, Japan's colony. It shows six steamship lines between the empire and the colony. Another relief-map shows the Korean and Chinese coast. The map ends just beyond Port Arthur. "How about Mukden and Harbin?" I asked a Japanese in charge of the exhibit. "Just wait a little," he replied; "the war is not over."

As you leave the large maps and pass between the bamboo gates that separate them from the other part of the exhibit, you see the flag of the Japan Mail Steamship Company, which has the largest exhibit in this section. The flag has two red bars on a white field, and it stands for a corporation with a capitalization of $11,000,000 and owning eighty vessels of 259,963 tonnage. Under its flag Japan's commerce has gone around the world. The company has equipped an elaborate reception room for the inspection of visitors. It is an enlarged first-class saloon of one of their steamers, and is an ornate specimen of Japanese decoration. It was designed by Mr. Kawashima, a court artist. In it Japanese architecture is combined with European furniture. The walls are of gilt wood with carved chrysanthemums interlaced with vines. On the brocade hangings are embroidered peacocks and chrysanthemums. The ceiling is exquisitely carved. You can sit in the midst of this reproduction of Oriental luxury and watch the large locomotive puff and hiss at the testing-plant of the Pennsylvania Railroad fifty yards away.

With models of transoceanic steamers, with cross-sections of cabins, with sea-route charts, and with tables of statistics, the whole astonishing growth of the Japanese merchant marine from the primitive junk in 1860 to twin-screw 5,000-horse-power ocean steamers in 1902 is shown. Fourteen hundred vessels, 969 of which are steam, fly the Japanese flag on the high seas. Formerly the large steamers were foreign built, but the newest ships of the Japan Mail Steamship Company are all built at the Yokohama and Nagasaki yards.

VARIED INDUSTRIES

At the entrance of this section, with bronze and porcelain lanterns as outposts, is a reproduction of the ancient temple of Nikko, in front of which are draped the Japanese and Exposition flags. Like a pagoda, the temple has a second story of bamboo. The detail of the woodwork is carving representing chrysanthemums, dragons, and catalpa leaves. Instead of shrines, the temple is fitted with large glass cases, where the most delicate and exquisite examples of Japanese keramic art, embroidery, and tapestry may be seen. In the west case, for example, is a pair of cloisonné vases, green and gold, with chrysanthemums, valued at $10,000. The cloisonné pottery, in which the Japanese excel and which is represented by hundreds of vases, has been made in Japan for four hundred years. The designs are enameled on metal and highly glazed. The Satsuma pottery, which is displayed in great profusion, had its origin three hundred years ago in this fashion: A Japanese general brought a Korean prisoner to the Satsuma province. The Korean modeled a vase with soft clay and then burned it. It was a process new to the Japanese. They induced the Korean to teach them. This was the beginning of an industry which now employs thousands of people and by which Japanese art is represented all over the world.

Radiating from the temple in fan-like shape are long rows of cases and shelves where the best specimens of Japanese industrial art are displayed. To the left are the screens, many exquisitely embroidered or painted with birds and flowers; metal-work, pewter and silver articles; to the

right is the lacquer-work, which for seven hundred years has represented patient Japanese industry and art, and which last year amounted to $3,000,000 in value; ivory carving, likewise an ancient art; porcelains and lamps. To see the Delft ware would give the impression that it was a corner of the Holland section. The Japanese claim that they originated the Delft blue; that the Dutch traders of the seventeenth century who visited the Island Empire acquired the art and took specimens of it back to their country, where an historic industry was established in 1635.

Down the centre aisle of this section, and past row after row of stately vases and impressive bronzes, you suddenly come upon a model Japanese house standing amid the many wares. It is near a door, and the breezes make the bamboo hangings rustle. Like the whole Japanese section, it is cool and comfortable. It is the Kioto salon, and is the exhibit of the Kioto Chamber of Commerce. It is built of wood and bamboo, with the simple lines of the conventional Japanese architecture. There are two rooms, whose decorations reflect the peculiar symbolism of the people. The east room is the spring room, and the paintings and hangings have the very breath of the springtime about them. The crêpe hangings are embroidered with cherry blossoms, and the tapestry shows the snow-capped mountain of Fuji gleaming through the spring mist. In the picture corner (for in a Japanese room only one picture is hung) there is a graceful spring landscape. Instead of chairs, there are low stools with green upholstery. On the shelves are Satsuma vases with spring blossoms. Sliding bamboo doors separate this apartment from the autumn room, where the decorations are in harmony with the fall season. Maple leaves in the richest of red autumnal tints are worked in the matting on the floor and in the hangings. The screens and walls show white and yellow chrysanthemums. The upholstery is brown. The whole effect is quiet and restful.

In contrast with the simple dignity of this house is a sumptuously furnished Japanese room a few feet away. The walls are elaborately carved lacquered wood; the heavy silk hangings show events in Japanese history; the chairs, patterned after the temple furniture, are massive gilt. The ceiling is a wonderfully carved representation of a flowery heaven, with angels disporting among the blossoms. The value of this room, with its appointments, is placed at $45,000. It is the most costly single Japanese exhibit.

Richly carved cabinets and chairs, brass and bronze family shrines (which are set up in every Japanese house), massive urns, delicate porcelains, lacquer, and beautifully embroidered gowns complete an exhibit that represents a nation's industries that last year were worth $125,000,000.

MANUFACTURES

The Japanese section in the Palace of Manufactures shows the industrial achievement of the nation as completely as the Varied Industries section displays the ancient arts. Here, again, the flag of the rising sun first greets the visitor, and as you enter the exhibit you realize fully the extent and meaning of the fact that surprised the manufacturing world—that Japan's manufactures last year were worth $85,000,000.

Japan's principal product is silk, and the whole process of its making, from the culture of the silkworm to the finished goods, may be intelligently followed. But silk was not always the nation's chief product. How its manufacture began is another typical story of Japan's development into a successful commercial people. Eighteen hundred years ago a Chinese prince brought the first Chinese silkworms to Japan. The worms were fed with mulberry leaves. When the raw silk was obtained, Chinese weavers taught the natives how to weave cloth. From this beginning has grown the raw silk industry of Japan, which last year produced a yield worth $40,000,000.

A large part of the exhibit, therefore, is devoted to silk. Cross-sections of worms and cocoons of heroic size give the visitor an idea of the origin of the silk. There is a large model of a silkworm nursery and of a silk factory. Scores of Japanese men and women in native costume are shown at work. You will see here a series of photographs of scenes in the Imperial Silk Conditioning House, at Yokohama, where all silk is inspected by government officials and where a bureau of education for silk-workers is maintained. Sericulture is taught at the Imperial colleges of agriculture.

Having seen the origin of silk and the process of its treatment in the mills, the

visitor may go to a dozen cases showing what becomes of it after it leaves the mills. Rolls of flowered silk worth $300 each may been seen. In the shape of dresses, kimonos, tidies, fans, screens, handkerchiefs, and shirts, the silk fabrics displayed are the work of Japanese men and women. The Japanese dyed silk has symbolic figures with picturesque effects.

But silk is only one part of the display. Wherever Japan is known her lanterns, parasols and fans have gone. When you reach the fancy-goods section in the centre you get the impression that a Japanese fête is being held. Overhead are swinging strings of gaily colored lanterns interspersed with opened paper parasols. Japan supplies the world with paper fans, and the business last year amounted to $600,000. The value of the parasols made last year was $1,500,000.

For hundreds of years the Japanese have made fireworks. The American, however, is struck with the daylight fireworks, displayed in many kinds. These are merely shells of paper inclosing folded tissue-paper. The shells are sent up in the air, exploded, and the tissue-paper emerges, opening into the shape of a fountain of color, a dragon, or a bird. The display of Japanese dolls, ranging from the little geisha girls to the large Mikado type, is a delight to the little ones. Some of these dolls are gorgeously dressed in silks and look like miniature empresses. The toys show that the Japanese child finds diversion in blocks and wooden houses as the American child does.

At the west end of this section may be seen the largest exhibit of matting ever made by Japan outside the empire. The fact that 30,000 people are engaged in weaving it, that over 10,000 acres are devoted to the special cultivation of the matting grasses, and that the value of last year's product was $2,000,000, show the importance of the industry. The processes from growing grass to silk-woven matting are shown by product and pictures. There are 300 rolls of matting of all kinds. Matting made of twisted grasses is displayed for the first time. Closely allied with matting is straw and chip braid. The Okayamaka Straw Braids Association, one of the new commercial organizations, shows hundreds of yards of straw braids. Chip braiding is made from pine shavings. The Japanese saw a sample of this thirty years ago. They sent several natives to Switzerland to learn the work. These natives returned and taught other natives. This was the beginning of an industry that, combined with straw braiding, does an annual business of $1,500,000. Three-fourths of the hats worn by American women are made of braids made and twisted in Japan.

Japan has no further need to import many kinds of surgical instruments. An exhibit of delicate steel instruments, made in Tokio, shows another important advance. A group of Japan-made cameras shows that the Japanese have applied themselves successfully to another industry.

MINES AND METALLURGY

At the entrance to the mining section stands a working model of the Mitsui Mining Company, eight feet high, equipped with steel-geared shafts, power station, huge chutes, and the latest mining machinery. Electric cars convey the ore from mine to colliery. Ten feet away is a model of the Kosaka Smelting and Refining Company, the largest copper producers in the empire. At this plant is the largest furnace in the world. Electrical apparatus for separating the ore is employed. These models tell the story of a notable development.

Coal and copper are the chief mining products, the output of coal last year being 9,000,000 tons, and Japanese mining capital aggregates $350,000,000.

A striking feature of the mining exhibit is a reproduction of the famous Takashima Mine, which is on an island near Nagasaki. A geological section shows how the Japanese miners have mined under the sea. Nothing, however, is more suggestive of the scientific character of Japanese mining than the exhibit of the Imperial Geological Survey. Organized less than twenty years ago, it has rendered a conspicuous service by classifying and analyzing soils and minerals, many of which are displayed. Under its influence the Mining Institute of Japan was organized to promote the science of mining.

Outside the exhibit, the visitor may see a gilt bar six feet tall, representing in actual size last year's gold output of 96,000 ounces. Alongside is a silver bar the same size, representing one-thirty-fifth the actual size of a bar weighing 1,855,000 ounces, the silver output for the same period. This

whole exhibit is a concrete result of new methods and new ideas in a country where mining has passed from primitive to latest methods in less than half a century.

EDUCATION

"What is the best building in any Japanese town?" I asked Mr. Matsumura, the Imperial Educational Commissioner.

"The school-house," he answered.

In this brief reply is summed up the progress of education in Japan, which this exhibit compactly shows. By starting with the kindergarten exhibit you can follow the Japanese child from elementary studies to the Imperial University, at Tokio. The paper-folding of children four years old is shown. Games, handiwork, and story-telling are the methods employed. Children from three to six years old are taught in the kindergartens. The school age in Japan is from six to fourteen years. There is a compulsory education law, and the statistics posted on charts show that 92 per cent. of the children go to school. The coolie's son has the same public educational advantage as the banker's child.

Every class of public schools in Japan has an exhibit. You pass from elementary schools to the secondary schools. After four years the pupil enters the higher common school, where the course is six years. The manual-training work, which is part of the public school work, is represented by numerous examples in wood-turning. The middle schools, corresponding with our high schools, are next.

In these, English is taught. In this exhibit you can see an English composition by a Japanese girl fourteen years old that is not unlike the same kind of work by an American girl of the same age. Tuition at the middle schools costs 50 cents a month. At the higher schools, corresponding with our colleges and universities, the tuition is $1.75 a month. Graduates of the higher schools go to the Imperial University.

The work of the Imperial Department of Education is shown by striking charts. One of these shows that in Japan there are 30,158 schools. These include institutions for the deaf, blind, and feeble-minded. There are 854 technical schools. In all these schools there are 126,712 teachers and 5,469,442 pupils, or one-tenth the entire population of the empire.

Specimens of work done in the technical and art schools show the constantly broadening culture of the empire.

ELECTRICITY

Following the order of buildings, the next Japanese section is in the Palace of Electricity, where, on a map thirty feet high and twenty-five feet wide, you see a reproduction of Japan's greatest engineering achievement, the Lake Biwa Canal, seven miles long and connecting Lake Biwa with the city of Kioto, the second largest city of the empire. It was planned and built by Japanese. It provides an important water highway, irrigates an extensive territory, and its power plant makes the electricity for Kioto. It cost $660,000. You can speak by long-distance telephone from Tokio to Kobe, 376 miles distant. In 1877 there was not a telephone in the empire. Today there are nearly 25,000 telephones in use. Model exchanges and the apparatus used in Japan are part of this exhibit. The remainder of the exhibit is composed of electrical apparatus invented by Japanese.

AGRICULTURE

As cotton is king among American products, so tea is king among the Japanese. In the centre of the agricultural exhibit stands a tea-house, the exhibit of the Central Tea Association of Tokio, composed of fifty-seven leading tea-growers. Over a hundred varieties of tea are shown. Figures representing dainty Japanese girls serving tea are in the centre of the house. Characteristic of the Japanese commercial spirit is the fact that a tea company sent 100,000 packages of tea for free distribution.

Significant of the new agricultural movement in Japan is the exhibit of the three government experimental farms which is in charge of an expert who spent several years in the United States studying the methods of our agricultural colleges. Rice is the cheapest and most popular food with the Japanese people.

The crops were frequently failures, and it became necessary to import large quantities. Through the work of the experimental farms a successful fight against crop-destroying insects has been carried on. Rice at various stages of its cultivation is shown, together with specimens attacked by insects. There

are now thirty-eight experimental farms in Japan, which are really agricultural training-schools. The rice investigation is only part of a valuable work which includes forestry and irrigation.

That Japan's tobacco industry is important is shown by the large display of leaf tobacco in this exhibit. Last year's crop was 60,000,000 pounds. Next to the tobacco are the fruits, mostly persimmons, which are five times as large as those raised in the United States; pears, apples, and oranges. The largest crop is oranges. In this exhibit you may see beer brewed after the German fashion, at Tokio, and *sake*, the Japanese wine. *Shoyu*, the Worcestershire sauce of Japan, is displayed in a thousand bottles arranged as a pyramid, while near at hand are canned goods of many varieties, prepared and packed in the most modern tins. Indeed, the whole exhibit is like a section of an American delicatessen shop.

FORESTRY AND FISH

From the Palace of Agriculture a short walk takes you to the Forestry, Fish, and Game Building, where the fertility of Japanese resources is again proved.

Entrance to the Japanese section from the north is through a reproduction of a temple made of twenty different kinds of native wood. Much space in the exhibit is devoted to the work of the Imperial Bureau of Forestry. One-half of the Japanese Empire is wooded, and the bureau has undertaken to protect this. The forests are divided into utilization forests, to be cut, and protection forests, for the preservation of trees and the pleasure of the people.

Since bamboo is one of the articles most used in Japan, the display of it is considerable. Twenty varieties are here. All stages of its growth, from tender shoots, which are canned and which are as delicious as asparagus, to logs used for the construction of houses, may be seen.

The sportsman finds much to divert him in this section. Japanese fishing-tackle is shown in many varieties. Nearly all the bamboo fishing-poles used in the United States come from Japan. Following the example of the United States Fish Commission, Japan has established a fish association to protect the fisheries and punish the unlawful catching of fish. Charts showing the fishing-grounds are exhibited by the association. There are small models of Japanese fishing-boats. Salmon, mackerel, and sardines are canned extensively in Japan, and the exhibit of this canned food is large.

THE JAPANESE PAVILION

With a visit to the Japanese section of the Palace of Fine Arts, where the best examples of the works of the modern artist, sculptor and potter may be seen, the general survey of the Japanese exhibit is complete. From building to building the whole national industrial progress and achievement have been followed. To crown this trip through Japan with the final picture representing the color and beauty of the island landscape it is necessary to go to the Imperial Pavilion on the hill just south of the Exposition power-house, easily located by the Ferris Wheel, the unsightly background for a lovely spot.

When you pass between the massive feudal wooden gates, emblazoned with the royal crest, which mark the entrance, you leave behind the prosaic din of the Exposition and enter the domain of Japanese landscape beauty. On the left, gay with red paint, is the Formosa bamboo tea-house. Following the main walk, you reach the top of the hill, where, from a tall flag-pole, flies the Imperial flag of Japan. An Exposition panorama is spread before you—to the north, beyond the smoke from the power-house, is the huge Palace of Transportation, and beyond that are the tall towers of the Palace of Machinery. Far away to the right rises the stately dome of Festival Hall, while to the left is the imposing group of foreign buildings, with their bright flags fluttering amid the gardens.

But much fairer is the scene about you skirting the top of the hill. Suddenly you are in the midst of what the Japanese have not ill named, the "Enchanted Garden." A small lake gleams in the sunlight; at one end is a little waterfall, and in the centre, on a miniature island, is a summer-house. Iris grows in the water, and overhanging it are dwarf pines, brought from Japan. Along the hillside this lake winds its way between hedges and flower-beds. Metal cranes and quaint tall iron and stone lantern-posts are seen through the low trees. At the north side of the lake is a tea-house with wide galleries, where Japanese girls serve tea and where you can sit in the fragrant coolness and watch the play of the sunlight

upon the waterfall. Beds of chrysanthemums, peonies, and hydrangeas flash their color. Beyond the lake is a model Japanese house, whose bamboo shades and fresh, clean matting betoken comfort. Across the hill are the headquarters of the Japanese Commission, where twenty clerks are engaged in the business of routine work and where are also the main offices of the Japan Exhibit Association. Here, too, Baron Matsudaira, vice-president of the commission, a distinguished Japanese nobleman, receives the visitors, with stately courtesy, in a cool matting-hung room.

Near the top of the hill is a large pavilion used as general reception room. It is made of wood and bamboo, and contains examples of Japanese costumes from the feudal days of the sword-carrying Samurai to the present time. In the centre of the room hang portraits of the Emperor and the Empress. The only hint of war in the entire Japanese exhibit is in this room, in the display of the Red Cross Society, consisting of army and navy emergency medical boxes and pictures of Japanese nurses.

In arrangement and detail the national pavilion shows that, to the achievement of commerce and industry, the Japanese have brought the perfection of landscape beauty, another expression of the genius of a people who, in the art of war and the pursuits of peace, are steadily making their way to a large place in world power. For this is the real significance of the Japanese exhibit at St. Louis.

A MEASURE OF GERMAN PROGRESS

A VERY FULL AND VARIED DISPLAY OF RESOURCES AND ACHIEVEMENTS — A MARKED ADVANCE IN TASTE — AN UNPRECEDENTED EDUCATIONAL EXHIBIT — THE STORY OF A PROGRESSIVE PEOPLE

BY

JAMES GLEN

AMONG all the foreign nations exhibiting at the Fair, only Germany matches Japan in richness and splendor of display. In every "palace," in a broad, uncrowded space, blue-uniformed German guards walk about under German colors, in charge of exhibits that explain how the German Empire has forged to the front among the nations since 1871. Not merely does the German Building fill the eye with its imperial halls and stately chambers—this reproduction of Queen Sophie Charlotte's eighteenth century castle, filled with the treasures of William II. But German industry sets forth the activity that has already outstripped, in some departments, the industrial efforts of England. German mining and German farming and German forestry tell of German greatness.

All the unequaled sweep of German education, classical, medical, technical, scientific, historical, is shown in models, appliances, specimens, and pictures, with unprecedented minuteness. The highest-soaring balloon, the fastest railway car, the swiftest steamship—these are German. Germans can teach others how to live—German rooms, German carpets, German furniture, German ware, German food, German drink, are lavishly presented, with suggestive effect. Five-sixths of the German domain is in colonies oversea; the methods and results of German colonial development are made clear in interesting object-lessons. German art shows an uplift; its evidences are here. By the direct command of the German Emperor—in some measure, to reciprocate the American hospitality to Prince Henry, but mainly to tell America what Germany is—the German nation has outspread its resources and achievements in a picturesque and significant array. Wherever the red-and-black-and-white colors entwine the pillars of a section at the Fair, or the black Prussian eagle hangs overhead—and this is almost everywhere you turn—German genius has exploited itself richly and instructively.

There was an interesting idea behind much

of this. Traditionally, the Germans have been known as a people fond of the pleasures of the table, but untouched by the higher refinements of living. But since the federated States became the German Empire a new esthetic sense has developed. Of this, the nation has become more and more conscious. A new, distinctively German, art has begun to take shape. The Imperial Commission resolved, accordingly, to exhibit to the world at St. Louis what this Teutonic conception is. So, although the display of German foods in the Palace of Agriculture—the attractive dried vegetables, the bottled sausages, the conserves, and the fragrant, inimitable German cakes, the beers, and the wines obtainable by a thirsty visitor—although these give indication of the attention paid the table, the products of art and handicraft are more spectacularly displayed. Subdued and restful tints make the color schemes of furnishings in the German Building and in the German rooms in the Palace of Varied Industries. Carvings and moldings are chaste and satisfying. The furniture is simple. Candelabra, lamps, balustrades, and pottery are restrained in ornament and graceful in form. "Not too much," is the motto everywhere. Even the gifts to Emperor William from the German cities—exhibited in the German Building—are rich rather than gorgeous, and it was a controlled imagination that designed the clock which the Emperor sent as his special contribution to the Fair. Stateliness or comfort, or quiet beauty, then, is the mark of the ubiquitous German exploitations of the best German way to live.

Next, the German exhibits stamp a deep impression of the preëminence of education in the empire. One sees in the Palace of Education comprehensive museums of laboratory, dissecting-room, and lecture-hall equipments from universities and schools. But one also finds in the Palace of Agriculture a food- and drug-testing laboratory, provided with elaborate appliances and instruments; in the Palace of Electricity, a laboratory equipped for every possible test, from a delicate experiment in electro-chemistry to a comparison of dyeing substances; in the Forestry Building, all the necessary means for studying trees —and so on, indefinitely. German study is not confined to the reading of scholarly tomes or the making of purely scientific researches—it concentrates, too, on the practical business of life. Germany is the university of the world; the St. Louis Exhibition is designed to show that its educational reputation is being maintained.

Yet the Germany that makes this demonstration is but a new community. A half-century ago it was an aggregation of agricultural states, producing almost everything they needed. Now a nation, it imports one-fourth of its food, largely from the United States. Its population is a little more than 56,000,000 individuals, over whom is coming an economic change. From 1882 to 1895, for example, the agricultural population decreased about 4 per cent., and its industrial and its business classes increased 26 per cent. and 32 per cent. In the same period, industrial efficiency improved so greatly, through the use of machines, that, though the number of iron-miners decreased, the output increased one-half; and in beet-sugar production there was a decrease of two-fifths in the number of persons employed, while the production trebled. The national income increased one-quarter in the last five years. From 1880 to 1902, imports grew 104 per cent. and exports 62 per cent. In 1891, German ships carried but 52 per cent. of the German traffic; in 1901, they carried 59 per cent.—the gain at the expense of England. Germany has increased its business with the United States until it now imports more from us than from any other country, and exports more to us than to any other country except Great Britain and Austria-Hungary. The exhibit at the Fair, then, is the exploitation of a country transformed from an agricultural community into an industrial one—for the purpose of bringing its significance home to the country (one-eighth of whose population is German) with which it does the greatest total business.

The German Government Building, in its dull tone, is one of the most distinctive buildings at the Fair. It is surrounded by terraces and gardens, and to the rear is a German wine restaurant.

The educational exhibit is wonderfully comprehensive. Plans, maps, and models show the excavations that German scholars have made in Babylon and Egypt; for, in this field of research, Germans have been first. Pictures of German universities are shown. In the Palace of Electricity is a full-sized model of an alchemical laboratory of the fifteenth century, and, directly opposite, the laboratory

of Liebig, the father of modern chemistry, as it stood in 1835. Near-by, beyond a library of chemical authorities, is arranged a collection of the most highly developed chemical apparatus in the world—much of it of recent invention. Nor is this merely academic. The manufacture of chemicals is an important German industry, and the appliances—and materials, too—exhibited here and in the Palace of Education have commercial importance, for one German steel mill employs 100 chemists. Novel electro-chemical apparatus is shown—measuring instruments and electrical furnaces. Indeed, chemistry is exploited to the last detail.

There are preserved biological and anatomical and pathological specimens, models, and pictures illustrating German methods of teaching medicine, and also hospital equipments in the Palace of Education. One need not go to Germany to learn even the minutest point in German school and university education. It is all set forth in the education exhibit from bacteria down to the A B C, and back again to the kind of kayak one should take on an Antarctic expedition.

The German art is taken up in another article: it need not be considered here. In the Palace of Varied Industries are characteristic examples of German engravings, sculpture, architecture, and pottery. In the Palace of Liberal Arts, German printers present marvelous processes in a craft that the Germans have brought to a high point of skill. One firm exhibits seventy automatic printing-machines and specimens of books dear to the book-lover. The inventor of the paper matrix-plate shows printing inventions patented only this year. A firm of photographers displays examples of photographs on sensitized wood and leather. Germany publishes more books than any other country, and makes the best maps in the world; all kinds are displayed in sections in the Palace of Liberal Arts. Here, too, are marvelous scientific instruments—earthquake measurers, tubes for X-rays, vessels for liquid air, kite balloons, glass transparent to ultra violet rays, which will not pass through ordinary glass, and improved calculating machines. There are heat-proof pianos for the tropics, and other musical instruments.

The fullest possible collection is exploited of the chemicals made by the German manufacturers, who use the apparatus shown in the education exhibit, and employ the chemists trained in the university and scientific school laboratories. One may see almost every chemical known to man, from essences, oils, and dyes, to serums and rare metallic products.

Not even in the United States is so much attention paid to harbor works, dams, and canals, as is proved by the models and diagrams of the German engineering achievements.

An exhibit of the amber industry is interesting. And the exhibit of reproductions of the work of German silversmiths and goldsmiths recalls a story. When the Kaiser presented the Germanic Museum at Harvard with plaster casts of German sculpture and architecture, German citizens took the cue to make similar gifts of models of German craftsmanship in precious metals. The result is in the Palace of Varied Industries.

And, of course, Germany's unequaled toys are presented. The multifarious objects for furnishing and decorating homes and buildings could not be described in a volume; but note how well Germany proves that it knows how to live.

In the Palace of Transportation the display of models of the fastest steamships in the world speaks significantly of German trade intelligence. Germany is trying to win the trade of the world; in one light, its huge exhibition at the Fair is clever advertising. But Germany has found that, if a steamship can carry people or letters between New York and Hamburg in one day less than between New York and Liverpool, German business men have the immeasurable advantage of a 24-hours' start. The fast steamships, then, are a direct, conscious, and well-maintained assault on British commercial supremacy. Nor is Germany behind even France in automobiles—though France takes the palm at the Fair—nor behind the rest of the world in land transportation.

The exhibit in the Palace of Agriculture teaches one sharp lesson. In the United States complaint has been made of rigid German inspection of imported American foods—especially of meat. But it is clear that this is no anti-American discrimination. A laboratory is fitted up near the exhibit of German foods which reproduces the State laboratories maintained in Germany to test domestic foods and drugs as carefully as imported products. The German Government will not permit, as we permit, the adulteration o

foods; and it publishes the formulas of drug concoctions and patent medicines. Violators of the pure-food laws go to jail. One may see in the agricultural section how the tests of foods and drugs are made. Beyond is a section which gives a most accurate representation of German methods of reclaiming marsh lands, cutting off the peat for uses that range from torches to mattress fillings, and then growing crops on the layer of soil exposed. It is irrigation turned backward; the models and large paintings picture vividly how morasses in East Prussia have been turned into prosperous farms.

Nor is all the German utilization of natural resources confined to Europe. Step into the East Africa section. Here is an outfit of an African explorer: there are slabs of polished ebony. Crude African weapons are ranged behind a life-sized figure of a reclaimed Negro in khaki—one of the German colonial soldiers. Photographs tell suggestively the thickness of the forests through which German engineers have pushed the East African railway. Within the walls of this room, a visitor is transported to the heart of Africa; and he sees there how Germany is modernizing the wilderness and reaping its fruits. Altogether, the agricultural section is fascinating. There is a little human touch in the pride one of the exhibitors of food takes in a letter sent back from the recent Scandinavian trip of the Kaiser: "Your preserves, with cooking arrangements, have been tried on an outing into the hills which His Majesty the Emperor made with some of his suite yesterday, and proved very good."

In the German Section of the Palace of Varied Industries there is a series of forty-eight rooms, each one designed and furnished by an artist or architect—examples of home decoration and furnishing which show the taste of modern Germany. In Germany, at least, the days of the wholesale manufacturer of furniture seem numbered for the use of the discriminating, since modern decorative rooms, in which every piece of furniture is unique and hand-made, may be fitted up for less than double the cost of the ordinary hodgepodge from the store, and the value in durability and comfort is increased a thousandfold.

German mines and mining methods are elaborately shown in the Palace of Mining. Hospitals, sanatoria, insurance facts and figures, public health provisions, and municipal improvements are notably set forth in the Palace of Education. And, after a busy day of sight-seeing that an inspection of the whole German exhibit will fill with entertainment and instruction, a dinner within the cool precincts of the German Tyrolean Alps is one of the delights of the Exposition, as a dinner at the German restaurant is the luxury of the Exposition.

ENGLAND'S EXHIBIT THE STORY OF EMPIRE BUILDING

MASSED in every Exposition building, under the grouped flags of the United Kingdom, are the concrete examples of Great Britain's industrial achievements. In the Palace of Varied Industries, looms and spindles whirr, showing how raw cotton is made into spun yarn. In the Palace of Agriculture, English machines kneed dough and mold bread. The whole British exhibit, therefore, comprises not only products, but processes.

Until three years ago, England led the world in the production of coal. Now the United States is first. We export coal to Newcastle. But, in the Palace of Mines and Metallurgy, Great Britain shows, with maps and statistics, with improved electric mining-lamps, with huge lumps of coal, and some wonderful photographs of mines and miners, the whole extent of her coal industry that employs 900,000 men and produces 230,000,000 tons a year.

The charm and beauty of England's textile art and furniture are well expressed in the Palace of Varied Industries. At the west end of this section you suddenly come

on the model of an English country house, fresh and white, with a long piazza extending nearly all around, with dainty curtains at the leaded windows, and with ease and comfort stamped all over it. While the proportions of the conventional English country house have been maintained inside, the appointment of many of the rooms is luxurious. For example, the salon is a noble, high-ceiled room, with gorgeous Empire furniture. But beyond is a simple bedroom in blue, with cozy seats in the roomy bow-window. Two of the rooms are models of the royal apartments on the "Ophir," on which the present Prince and Princess of Wales made a trip around the world. In these state-rooms luxury is combined with comfort. The color of the boudoir is blue, and the hangings are silver and blue. In the dining-room is some rare old Wedgwood, standing in an old-fashioned mahogany cupboard.

Beyond the country house is the imposing display of British laces, silks, and embroideries, organized and made by the Royal Commission to illustrate, by means of costumes, hangings, and furniture, the employment of these textile fabrics for definite purposes. The exhibit is grouped in a noble-looking court, designed after the style of Sir Christopher Wren, and flanked by high glass cases. The exterior of the court was designed to show a series of heroic panel-paintings, with costumes from the sixteenth to the nineteenth centuries. Over the entrance of the court are the Royal Arms of Great Britain. The panel-paintings are adaptations, by students of the various schools of art in England, of famous pictures that show costumes typical of historic periods.

Ranging from the schools of London, where last year 884,610 pupils were enrolled, to Oxford and Cambridge, with the richest of scholarly traditions, the whole British educational system may be traced in the comprehensive exhibit in the Palace of Education and Social Economy. With drawings in color and models, the two most striking innovations in the system—nature study, and drawing from original objects instead of models—are effectively explained. The technical schools for the poor children of London, located in congested districts, show an educational work that is rescuing boys and girls from crime and starting them on useful and fruitful careers.

A touch of regal splendor and magnificence is given the whole British exhibit by the Jubilee presents of Queen Victoria, which are displayed in a long hall on the second floor of the Hall of Congresses, which forms one of the wings of the Palace of Administration. The building is permanent and fire-proof. Here, in twenty cases, guarded day and night by London policemen, typical "Bobbies," the pick of the force, are the princely tributes to a beloved queen from every province of her far-stretching empire. The gorgeous be-jeweled ivory caskets from Indian rajahs stand alongside the illuminated addresses from the London Jews. Canada's souvenirs are with Ceylon's. One of the presents is a tiger's skull, mounted with gold watch, barometer, inkstand, and penwiper, the gift of the Prime Minister of Hyderabad. The largest present, perhaps, is a massive ivory casket, supported by four Corinthian pillars of gold and ornamented with placques of gold. Upon the lid is a gold spray, composed of the rose, the shamrock, and the thistle. These emblems are studded with 212 diamonds —polished and rough—from the Kimberley mines. The casket is lined with ostrich feathers, and has a case of crocodile hide. It is the gift of the town of Kimberley. The total value of the presents exhibited is $6,000,000.

Distinctive among all the foreign pavilions is Great Britain's. Occupying a commanding position at the entrance to the Section of Foreign Buildings, it looks more like the wing of an old palace set amid an English garden than a temporary structure at a world's fair. It is a reproduction of Queen Anne's favorite retreat, the Orangery of Kensington Palace, and is built of red brick and stone. A structure of dignity and fine proportions, it is at once simple and strong.

After the stately grandeur of the interior of the pavilion, it is pleasant to turn to the formal garden that surrounds it. Here an attempt has been made to reproduce the kind of garden attached to an English mansion during the reign of William and Mary. The lawn is a typical British lawn, well-rolled and smooth. There are graceful terraces and shady avenues. Here and there are trim flower-beds, gay with color. But more characteristic are the yews and the box-shrubs clipped into the shapes of birds and animals.

It is a worthy setting for the representation of a mighty nation at a great fair.

OTHER FOREIGN COUNTRIES

THE pink tint of the French Building—a replica of the Grand Trianon—gives it a distinction heightened by an aloofness secured by a French garden, interspersed with statues, which surrounds it, and by a fourteenth-century iron gate at the entrance. Historical data have shown that Louis XIV.'s architect planned groups of statuary on the high balustrade of the Grand Trianon which were never placed there. These have been supplied upon the imitation at the Fair, and the spirit of the modern French republic is expressed by added representations of the arms of the nation, flanked by a figure of Armed Peace and a figure symbolical of French commerce. The building is at one end of the long main avenue of the Fair—at the other end of which is the Government Building.

Within, apartment succeeds apartment, on the ground floor only, around three sides of a quadrangle. One contains busts of famous French writers and statesmen, but in the main the whole supremely luxurious series is a commentary on the height to which the French were led by pleasure-loving kings to bring the refinements of living. Gorgeous tapestries, intricately decorated furniture, allegorical paintings, beautiful Sèvres porcelain, sculpture that gratifies rather than inspires, elaborately decorative carving, all the concomitants of beauty-loving ease, are gathered in overflowing plenty. The city of Paris, however, has a room that is explanatory, informing, commemorative. In this building France exploits its history, its literature, and its art.

France contributes an unmatched high-pressure engine in the Palace of Power and Machinery, an entertaining historical presentation of cables and cable instruments in the Palace of Electricity, and reaches its high-water mark in the really beautiful automobiles in the Palace of Transportation. Since the Gordon Bennett race was won by a French automobile, many of these have been bought by Americans. The French exhibit, taken all together, is formal, but it is the greatest France has ever made abroad.

You cannot escape Canada. Its building is on the main traveled road that leads to the doors of the Palace of Agriculture, and just below the floral clock. Crowds are constantly streaming in and out, and passers-by stop to rest on the hospitable verandas. Behind is a building given over entirely to the Canadian forestry display. Nobody can pass the effective Canadian agricultural exhibit without stopping to comment, and a striking collection of Klondike gold, in the Palace of Mines—electrically illuminated in a glass-fronted safe—is but an inescapable invitation to learn of the other mineral resources of British North America from the visible proofs set out beside it. The Canadian Department of Agriculture has a regular Exhibition Bureau.

Walk straight through the Canadian Building to the rear. You step into a well-lighted picture gallery. The first painting on the left shows a Northwest pioneer breaking his first furrows of Canadian soil. Step by step the paintings recite his rise to prosperity. The last shows a fruitful farm, with a comfortable residence, barns, herds, and wonderful crops. As you turn away from the final picture—they were all made from photographs of actual scenes—the door that confronts you leads into what? An immigration office! And already many an American farmer has studied those pictures (making vivid, as they do, the facts blazoned in the agricultural exhibit where he has fingered the heads of wheat and barley), has stepped into the immigration office, picked out a location on the huge wall-map of British North America, and made arrangements for transportation. Not for nothing has the Canadian Commission spent four years in forming their exhibit, gathering grain for their demonstration all the way from the Peace River country to the international boundary, and Canadian products from Vancouver to Prince Edward's Island. Canada at St. Louis means business.

Austria's National Building, with its blue-and-yellow walls, bright in the sunlight, greets the visitor as he comes from the Administration Building. Flanked by tall posts, surmounted by the Austrian eagles, and with

fountains playing on each side, this pavilion is one of the gayest of the group of foreign structures. The building is not only the headquarters of the Imperial Commission, but in appointment it illustrates, to a large degree, the artistic progress of the various countries composing the Austro-Hungarian monarchy.

When the Swedish Government was invited to participate in the St. Louis Exposition, along with all the other nations of the earth, the government declined to erect a national pavilion. But the Swedish people, who had thousands of kinsmen in the United States, wanted a building where their flag could fly, and where the exiles from home could find a haven during the Fair. Popular subscription lists were started all over the kingdom, and enough money was raised to erect the gay blue-and-yellow pavilion that stands next to Austria's. The subscriptions ranged from 5 cents to 5,000 crowns. The pavilion was designed by Ferdinand Boberg, Sweden's foremost architect, who volunteered his services, and is an enlarged reproduction of the home of a well-to-do Swedish farmer of the seventeenth century. A large central room is flanked by wings.

Just beyond the Swedish Building a broad red-and-white flag flutters from a staff. The flag is almost as large as the quaint little brick-and-tile cottage that stands behind it. It is the Holland pavilion, a model of the kind of house that Rembrandt lived in. This house was built by private subscription on the space originally allotted to Russia. The Dutch Government hesitated so long about making a national display that the people took up the matter. Many curious Dutch articles are shown.

The first railroad train on the European continent ran from Brussels to Antwerp in 1835. The Belgian national pavilion looks like a small railroad station with a dome. On the outside walls are panels with pictures representing views in Brussels. Under these pictures are inscriptions that show that nearly every international congress for the promotion of peace, health, literature, art, science, and religion was held in Belgium. The range of meetings is from the First International Congress of Hygiene, in 1854, to the first international meeting about sugar, in 1903. Belgium has concentrated all her industrial exhibits in this building. The interior is impressive. The dome is high and frescoed with the royal crests. On the walls are striking statistics of Belgium's industrial advances. Last year, for example, the output of steel and iron was 3,000,000 tons.

China's civilization is thousands of years older than Japan's, yet her exhibit at the Fair is one that could have been made two hundred years ago. Japan's represents the most advanced industrial achievements. China's building shows a primitive architecture; her exhibit, merely the formal things that Chinamen have labored on for centuries. The pavilion is a reproduction of a mandarin's home, with gay outposts of bamboo, near which flies the yellow flag with a black dragon. The house is gorgeously Oriental in appointment. The bedroom, for example, is a maze of silk hangings, bronze lamps, rich screens, and lacquered cabinets. All the rooms of the house open on a court. China's exhibit in the Palace of Manufactures is large and crowded with carvings representing junks and pagodas; old armor, embroidered silks, ivory pieces of curious carving, and sandal and teakwood boxes, that give out pleasant odors. But these things are old as the great Celestial Empire. No advance is represented in the exhibit; only the adherence to a tradition of patient mechanical work.

Mexico determined to give, at the Fair, a new idea of her progress from national lethargy to an industrial activity, and she has succeeded. In the largest foreign space in the Palace of Manufactures she shows a significant development. Twenty-five years ago nearly all the shoes worn in Mexico were imported from the United States. The display of shoes from Mexican factories shows the establishment of a score of factories, and a product that compares favorably with our own. Formerly, Mexico imported all her cashmere cloth; now she makes it. Typical of the industrial expansion of the country are exhibits of handsomely carved furniture, silks, plumbing supplies, and hats. Onyx, which is a leading article of export, is displayed. The nation's growth in transportation, postal service, and engineering is pointed out in the transportation article printed elsewhere in this number. The national pavilion is a replica of a Mexican house, contains a court, and is surmounted by a tower. Surrounding the building are thick cactus-beds. A large portrait of President Diaz, the republic's foremost citizen, hangs

in a conspicuous place. The whole effect of the Mexican display is to impress on one's mind the steady progress of the nation.

Crowning a hill near the Administration Building, and commanding a fine view, Italy's pavilion is one of the most spectacular of all the foreign group. It is built of white staff after the style of the classic ancient Roman buildings. In front is an imposing colonnade, reached by stone steps. At each side are massive vases with figures symbolizing Italy's greeting to the United States by wireless telegraphy, thus paying tribute to the invention of an Italian, Marconi. In front of the building are four caryatides, surmounted by bronze tripods. As an outside frieze are relief plaster figures, representing Italy's advance in art, commerce, and science. In the Palace of Manufactures, Italy has a maze of marble statuary—one of the principal industries of the country. In the Palace of Agriculture she displays oils and wines, representative of her largest export business.

Brazil supplies the world with coffee. Coffee of all varieties and its culture form the principal exhibits in the imposing national pavilion, the tallest building in the whole foreign section. Its huge white dome, where the green flag of Brazil flies, rests on eight Corinthian pillars. Twenty-one shields, representing each one of the United States of Brazil, are interspersed over the doors and between windows. Under the dome are loggias, accessible by stone steps. On these loggias visitors are invited to drink Brazilian coffee. Last year, Brazil grew 16,246,000 bags of coffee. All the other coffee-growing countries produced 3,342,000 bags. From one Brazilian town (Santo) 10,000,000 bags were exported. Large photographs show coffee at various stages of its culture. Machines that not only clean, but distribute the coffee beans according to size, have been introduced in Brazil.

Twenty years ago, the coffee crop of Ceylon was a failure. The planters then planted tea trees, thus starting a product that last year aggregated 150,000,000 pounds. In the Ceylon Building, which is a reproduction of the largest temple at Kandy, the ancient capital of the island, tea is served by Singalese, who step noiselessly, and whose gentle, sensitive faces are crowned by a mass of shining, black hair, neatly surmounted by a large circular comb. The tea is served on the spacious piazza. Upstairs are exhibited ivory, bronzes, and carved woods, typical of the work of the natives.

With a reproduction of a large Havana residence, Cuba makes her first exhibit as an independent republic. Over it is the flag that the United States has made possible. In a large court inside the building are busts of Cespedes, hero of the Ten-Years' War; Agramonte, a famous Cuban general; Marti, the liberator; and Maceo, beloved of all the Cubans. Of course, tobacco and sugar form the principal exhibits in the Cuban Section in the Palace of Agriculture.

Siam's Building, a replica of a temple at Bangkok, the capital, is the second erected by the nation at any world's fair. The first was at Paris in 1900. Guarding the entrance of the building are wooden elephants, similar to those that stand in front of Siamese houses of worship. The exhibit is taken from the Royal Museum, at Bangkok, and is intended to show art forms and technical skill of the Siamese of a century ago and the present time. No great industrial advance is shown, but the people have introduced improved farming implements, four railroads are in operation, telephones are in use, there is no public debt, education is general, and illiteracy is rare. Rice and timber are the principal exports.

The East Indian Building is an Oriental bazaar pure and simple. Externally, it is a reproduction of the famous mosque of Itmadul-Dowlab, at Agra, India, square in form, with minarets rising from the four corners. The domes are green. Swarthy, solemn East Indians, in spotless turbans, stand at the doors, which are of colored teakwood. Under the arches is lattice-work. In the centre of the building is one of the most elaborate pieces of wood-carving at the Fair—a reproduction of a temple of the Jain, a Hindoo sect. It is thirty-five feet high. The original temple is of marble, and is at Palitana, Central India. The bazaar is devoted to a display of all kinds of Oriental wares. Coffee and tea are served.

Coffee forms the principal exhibit at the Argentine Republic Building, a pink pavilion, located just behind the Austrian Building.

Nicaragua, with 200 specimens, shows the medicinal roots and flowers indigenous to the country. Coffee is also shown.

HOW TO SEE THE FAIR

IF it be possible, engage rooms before you go to St. Louis—at least find out where you may engage rooms for the price you wish to pay. If possible, do this by direct correspondence or through an acquaintance.

Rooms in good hotels are exceedingly costly, or overcrowded. The hotel-keepers put into their houses twice as many people as usual. The most satisfactory arrangement that persons of moderate means can make is to engage rooms (usually with breakfast) in some well-kept private residence. There are many such in the section of the city that lies near the Fair. The prices range from $1.50 a day for each person to $5 or more. If possible, arrive at St. Louis early in the day. Then you will have time to find rooms by daylight.

The wise fair-goer will carry only the most comfortable clothing, especially only the most comfortable shoes; for seeing any fair—this Fair in particular—is wearying. "By George," said a robust farmer, as he fell into a seat in the plaza about five o'clock one afternoon, "I've plowed all day many a time; and I know hard work as well as the next man. But this is the hardest day's work I've ever done—it uses you up." But he had no sooner laid his feet out in a comfortable position than he began to talk with enthusiasm about what he had seen. "It uses you up, but it's worth it." Knowing that you will become weary, plan for the least physical exertion possible.

If it be as convenient for you to make your first visit to the Fair at night as by day, go first at night. The main entrance is at the Plaza of St. Louis. There you will see the splendors of the illumination. Walk to the lagoon. Take a gondola and go the whole length of the canals. Then climb the steps to Festival Hall and look down. A ride on one of the automobiles about the great buildings and the State and foreign buildings will give you many good views. By ten o'clock you will be ready to go to your rooms; and you will have seen memorable vistas.

On your first visit by daylight, ride the full length of the intramural railroad, with a map of the grounds in your hand. Thus you will learn the general geography of the Fair. Then take one of the public automobiles, and you will learn the location of the several buildings. With this general information, make a definite plan for each day's sightseeing or study; and do not try to see too much.

The whole Fair cannot be thoroughly seen within less than a fortnight. (It is closed on Sundays, and the buildings are closed at night, but the grounds are open.) It cannot be thoroughly studied within less than a month.

A WEEK'S OR A FORTNIGHT'S VISIT

A day and a night given to general views and to the spectacle, select the parts of the Fair that you care most to see and visit them systematically. Any one of the large buildings will easily consume as much of a day as one can comfortably give to study. A good division of a day is to give the freshest hours of it to whatever building interests you most, and, after luncheon and a rest, to give the afternoon to some of the outdoor exhibits that make a less severe tax on the attention. The Philippine reservation and the Indian camp and school may well take a whole day.

Within a week (six days), by such a division of time one can see the spectacle as many nights as one pleases; may study the contents of six of the great buildings, and make six excursions to the outdoor and outlying parts of the Fair. A specimen day in such a plan would be this:

From 9:30 A. M. to one o'clock, spend in the Palace of Agriculture. There are nine miles to be walked in this building, if you examine all the exhibits. Rest at least an hour—two hours are better—at luncheon. From three till six o'clock you can spend in the near-by Philippine reservation. The day is gone and—your physical strength, also.

Another day: Give the morning to the Government Building; the afternoon to one or two of the foreign buildings, say the Japanese pavilion, the English and the French buildings. Again your day is gone.

In this way, after reading the descriptions of all the great subjects set forth at the Fair, select those that you wish to study and make your week's programme.

A fortnight's itinerary any visitor may

make for himself in the same way; for even twelve days of steady work by such a programme will do no more than give a general view of the whole Fair. If one proposes to study even one great department thoroughly, by asking many questions and by observing processes, a fortnight will be gone before the whole Fair has been visited. And none but the most stalwart will be likely to give even six successive days to such work; for it becomes very tiresome both to the faculties of attention, and to the feet. Old persons or persons who for any reason lack great physical endurance will do well to hire wheeled chairs. If they cannot afford this, they will do well to visit only one great department in a single day.

An accomplished student of mechanical inventions and of electricity went to St. Louis in May and took a quiet room for a month. He carried with him the notes that he had made at the World's Fair at Chicago eleven years ago, written on cards and arranged by subjects. He went to the Fair at St. Louis every morning and made a systematic study of some particular subject, taking notes on cards of the same size that he used at Chicago. He spent three or four hours studying exhibits, asking questions, and making notes. At his room, he compared the new facts that he had found out with the facts that he had written down at Chicago. "It was a month of wonderful instruction to me," he said. "Tell every young person in particular to come here, and bring cards for taking notes. They will be of the greatest value hereafter."

HOW TO FIND OUT INTERESTING FACTS

The silent visitor will learn much less than the inquisitive one. At every exhibit there is a man or a woman whose sole business it is to give information and to answer questions. In a whole fortnight you will not find a discourteous or unwilling attendant; and most of them are, of course, well-informed persons. They expect you to ask for information; and, by asking questions, you will find out things that you never dreamed of.

"Why is that pile of corn exhibited? The grain is not large, nor even." Thus spoke a visitor to an attendant at the Missouri section in the Palace of Agriculture. "That is a variety of corn that is grown not for the grain, but for the cob. Observe the size of the cobs. They are sold to make pipes. The grain is only a by-product." Almost any intelligent question will be rewarded with unexpectedly interesting information.

The relative importance of the several great subjects—such as Agriculture, Electricity, Machinery, Transportation, the Fine Arts, Education, Mining, etc., will, of course, depend on the personal knowledge and personal interest of every visitor. Every visitor, in making out his itinerary, will naturally give the two or three freshest hours of the day to the subjects that he cares most about; and he will use the others as recreation—as sights to be seen rather than as subjects to be studied. Most of the outdoor parts of the Fair (and there are dozens and dozens of outdoor exhibits) will serve as recreation studies.

The diversion given by the shows on the "Pike"—well, most visitors will wish to see a few of them. But one visit will be enough for most normal persons; for most of these "shows" are very stale and commonplace. Since the really enjoyable "Midway" at the Chicago Fair, "Cairo," "Mysterious Asia," the "Incubator," the "Imperial Russian Troupe," and half a hundred more have become cheap, if not vulgar. They give, however, no worse offense than cheapness and vulgarity. The mile of the Pike is a pandemonium. When another great fair is held, it is to be hoped that some originality will be shown in devising or selecting such diversions. These are very poor. Most of them are unworthy of a place within the inclosure. The visitor has a pyschological need of some such diversion, as every fair has a pecuniary need of them. But they ought to be made interesting.

THE COST OF SEEING THE FAIR

It is impossible to give any very helpful information about the cost of a week's visit; for no two persons have quite the same habits in spending. If your room and breakfast cost you $1.50 a day, and your luncheon 50 cents, and your dinner $1, your admission fee 50 cents, and your incidental expenses 50 cents a day—you have already spent $4 a day. A very frugal person can do more economically than this. But most visitors will find $5 a day necessary. Yet any one *can* see the Fair for half this sum; and most persons who have $10 a day to spend will be likely to spend it.

WITHIN THE CAGE OF THE WILD WATER-FOWL — PART OF THE GOVERNMENT DISPLAY

The largest flying-cage ever constructed

THE INSPIRING DISPLAYS OF THE STATES

PICTURESQUE BUILDINGS IN WHICH HOSPITALITY IS DISPENSED — TRADITIONS RECALLED AND RICH RESOURCES EXPLOITED — THE WEALTH OF THE NATION MADE VISIBLE IN THE COLLECTED PRODUCTS OF THE COMMONWEALTHS — THE UNITED STATES BECOMING ACQUAINTED WITH ITSELF

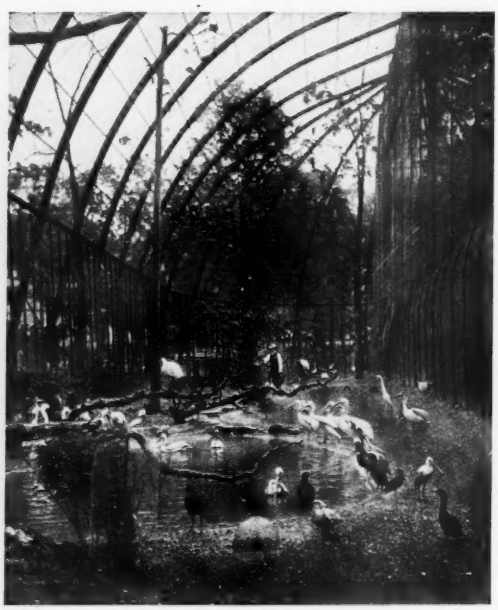
BY

"THE WORLD'S WORK" STAFF

No experience at the Fair is more inspiring than to realize the unity of the nation in watching the United States become acquainted with itself. The State buildings are commodious and comfortable clubs and rest-houses, where people from the same State spend their leisure moments, write letters home, and read the home newspapers, kept on file. Yet nothing has so surprised the hosts and hostesses of the buildings as the number of visitors from other States. The man from Maine drops in on Oregon, or a Massachusetts family calls on Minnesota. The Californian seeks reminders of his father's home in the Missouri Building, and his grandfather's in the reproduced Monticello of Virginia. The New Yorker visits the Indiana Building because his wife is from Indiana, and the Arizona Building because his brother is mining north of Prescott. We have more interests in distant States than we stop to think of, and the fact that Massachusetts is merely across the street from Kansas at St. Louis, and that the guest of one building is at home in the other, symbolizes a stupendous national fact.

The State buildings are mainly grouped among the oaks on the Plateau of States, though a few are over to the westward. The State exhibits are in the Palace of Mines, the Palace of Education, and in the vast structures devoted to horticulture and agriculture. One need hardly describe the State educational exhibits here, for in them is an approach to a uniformity of fullness and to a level of

INTERESTED VISITORS WATCHING THE SEALS AND TURTLES IN THE GOVERNMENT AQUARIUM



ONE OF THE OPEN-AIR BIRD-CAGES OF THE SMITHSONIAN INSTITUTION

excellence—the other exhibits are more characteristic.

THE LOUISIANA PURCHASE STATES

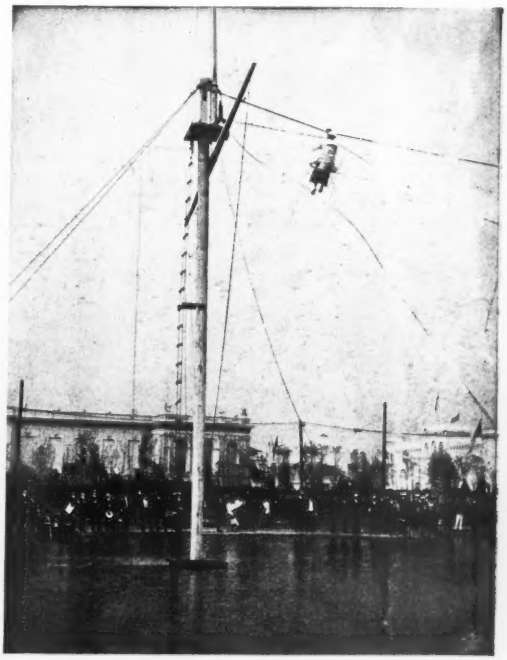
Naturally, the States of the Louisiana Purchase make a special effort at entertainment and exploitation: Missouri leads.

Crowning the gilded dome of Missouri's State Building is a statue of a beautiful young woman, with right hand outstretched—"The Spirit of Missouri." Over the main entrance is this inscription: "Embracing within her confines the elements of an empire devoted to all the arts and sciences that advance civilization, Missouri, the central State of the Louisiana Purchase, greets her sister States and welcomes the world."

Thus the State, whose metropolis is the Fair City, impresses her visitors with the large idea of a wonderful development. She has spent $1,000,000 in exploiting her resources at the Exposition. Her State building, erected at a cost of $250,000, stands on the loftiest hill of the imposing Plateau of States, facing the Government Building. Two large halls—the Blair and the Benton, named for distinguished Missouri statesmen—contain exhibits that show the broadening culture of the State. In Benton Hall Missouri artists show their work. Here, too, is the bronze ship-bell case of the battle-ship Missouri, the gift of the citizens of the State. In Blair Hall is a model public library, containing 8,000 volumes, 1,500 by Missouri authors, who include Mark Twain and Eugene Field. Ten years ago there were practically no public libraries in the small Missouri towns. Today few are without them. The model library aims to present the institution in operation. Any visitor at the Exposition may secure a book, through an introduction by some one known by the library officials.

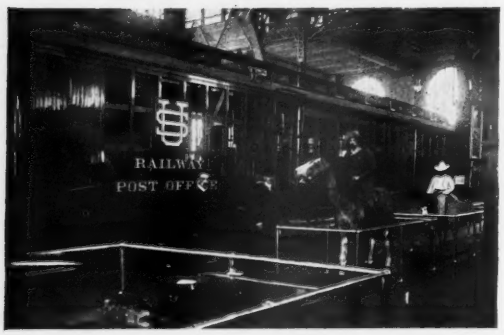
But far more significant than the stately building, with its golden dome and its stone approaches, is the record of Missouri's educational advance made in the Palace of Education. In three decades, illiteracy has fallen from 13.4 per cent. to 6.4 per cent. The average percentage of illiteracy in the whole United States for these periods was 17 and 9.1 per cent., respectively. The Missouri educational exhibit is the largest State exhibit at the Fair. A school in operation every day, with classes reciting, shows the process of education in St. Louis—whose excellent school system is given a comprehensive display. The schoolroom is rearranged every week, thus giving the opportunity to illustrate all stages of the work, from kindergarten to high schools.

THE UNITED STATES LIFE-SAVERS GIVING THEIR EXHIBITION — UPSETTING THE BOAT

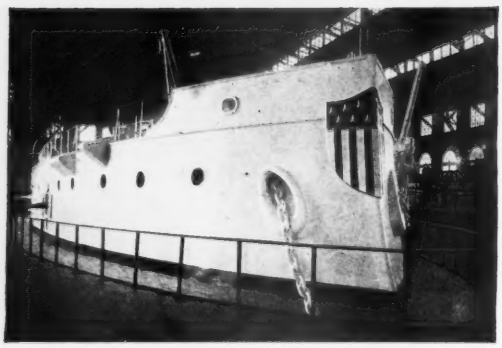


THE OUTDOOR EXHIBIT OF THE UNITED STATES LIFE-SAVING SERVICE: A LADY IN THE BREECHES

A UNITED STATES GOVERNMENT DOG-TRAIN WHICH CARRIES THE MAIL IN ALASKA OVER SNOW AND ICE



METHODS OF MAIL TRANSPORTATION SHOWN IN THE POST-OFFICE EXHIBIT IN THE GOVERNMENT BUILDING



THE FULL-SIZED MODEL OF THE BATTLE-SHIP IN THE GOVERNMENT BUILDING — THRONGED DAILY WITH VISITORS

LOUISIANA

In the shadow of the Missouri Building stands the replica of the white Cabildo in New Orleans, where, on December 20, 1803, was signed the document that concluded the Louisiana Purchase, and which created the empire of our Middle West. It is Louisiana's State Building, and is the actual size of the original building. In the rear is the court-yard, surrounded by a high wall, and in the yard is the stone prison, with dungeons and stocks. In the large court-room, on the second floor, is the low mahogany desk on which the Louisiana Purchase transfer was signed.

But Louisiana, rich in the historic traditions which cluster about the great events that the Fair commemorates, has achieved a great agricultural advance. Ten years ago, much of the rice eaten in the United States was imported from Japan and Honduras. Today rice is grown extensively in Louisiana. Within this period the State has created a new agricultural activity that rivals in output her two other products—sugar and cotton. It is typical of the State's growth.

ARKANSAS

Eighty per cent. of the timber used on the Exposition buildings came from Arkansas forests. Timber is the greatest resource of this sister State of Missouri in the Louisiana Purchase States, and, in her State building, a charming Colonial structure, may be seen a library of eighty wooden volumes, each one representing a different kind of wood from Arkansas. In all, there are 120 varieties of wood in the State. Not until twenty years ago could the vast timber resources of Arkansas be developed, because of inadequate transportation facilities. The rivers were the only means of transporting logs. But now half a dozen railroads cross the State, penetrating the timber sections and hauling vast quantities to all sections of the United States, and to sea-ports for export.

The Indian Territory Building, just back of the Utah Building, is a significant supplementary exhibit to the Indian reservation in the Anthropology section. It is a museum of the agricultural and handicraft products of Indians far on the road to civilization.

Oklahoma's name blazes in electric lights over her building, an attractive structure with inviting piazza. In the Palace of Agri-

culture, she makes an impressive display of her many agricultural products.

KANSAS

Kansas presents an elaborate modern building, and, as Kansans go there in families, it provides a nursery. Facing the door in the art gallery is a spirited painting of a slight slip of a Kansas girl, standing on a stile and peering across miles of level wheat-fields. Its high-piled exhibits of grains and fodders, in the great Palace of Agriculture, its gorgeous pavilion of plumed grasses, topped with a steer made of corn kernels, recall that Kansas teaches the world how crops may be raised, stock fattened, and dairy products increased to the best advantage. Kansas produces more wheat than any other State, and in ten years it has increased its output 73 per cent. In 1901, the wheat crop alone was worth four times as much as the Louisiana Purchase, of which it is a part, cost the United States. The corn crop is even greater. No State has fewer millionaires—or paupers. There are 218 colleges.

There is no Nebraska State building, but one need not leave the Fair ignorant of the details of Nebraska life. Nebraska concentrates itself on agriculture. In the Palace of Mines it exploits its corn as gold-nuggets from its many kinds of prairie soils. A pleasant rest-room, in lieu of a State building, occupies one part of the Nebraska Section on the main aisle of the Palace of Agriculture. Once there, you are in Nebraska. For when you have looked at the stuffed form of the largest steer ever raised, and have understood why corn, running forty bushels to the acre, at 40 cents a bushel, is being replaced in parts of Nebraska with sugar-beets, running 10½ tons to the acre, at four and one-half dollars a ton, a bell rings, and you step inside a little theatre. A biograph begins to whir. Before you, on a screen, the scenes of Nebraska life fly by. The corn is planted and harvested. The sleek cattle jog by to market. A street-parade passes in Lincoln. A county fair is reproduced. Meanwhile, a courteous lecturer explains the rapid progress of the State.

MISSOURI'S IMPOSING BUILDING

The largest State building at the Fair. It contains a model public library and convention hall

THE CABILDO
Louisiana's State pavilion is a reproduction of the New Orleans building in which the Purchase treaty was concluded

IOWA

The Iowa Building, a French renaissance structure, combining the features of the old State capitol at Iowa City and the new one at Des Moines, stretches across a tongue of land between two avenues, and thus impressively faces an open road. Hospitable arrangements permit Iowans to use the building for a post-office and for an information bureau. A large auditorium is provided for meetings—not only for Iowa gatherings, but for people of other States as well. The latch-string of Iowa is out for everybody. Well-attended daily concerts are given on a huge organ, presented by President Larrabee, of the Iowa Commission, formerly Governor of the State.

WASHINGTON'S STATE BUILDING IS SUPPORTED BY SINGLE TIMBERS 110 FEET LONG

Among the paintings is Colonel Thorp's portrait of General Grant, painted at the White House when Grant was president. It is unique, as showing Grant speaking.

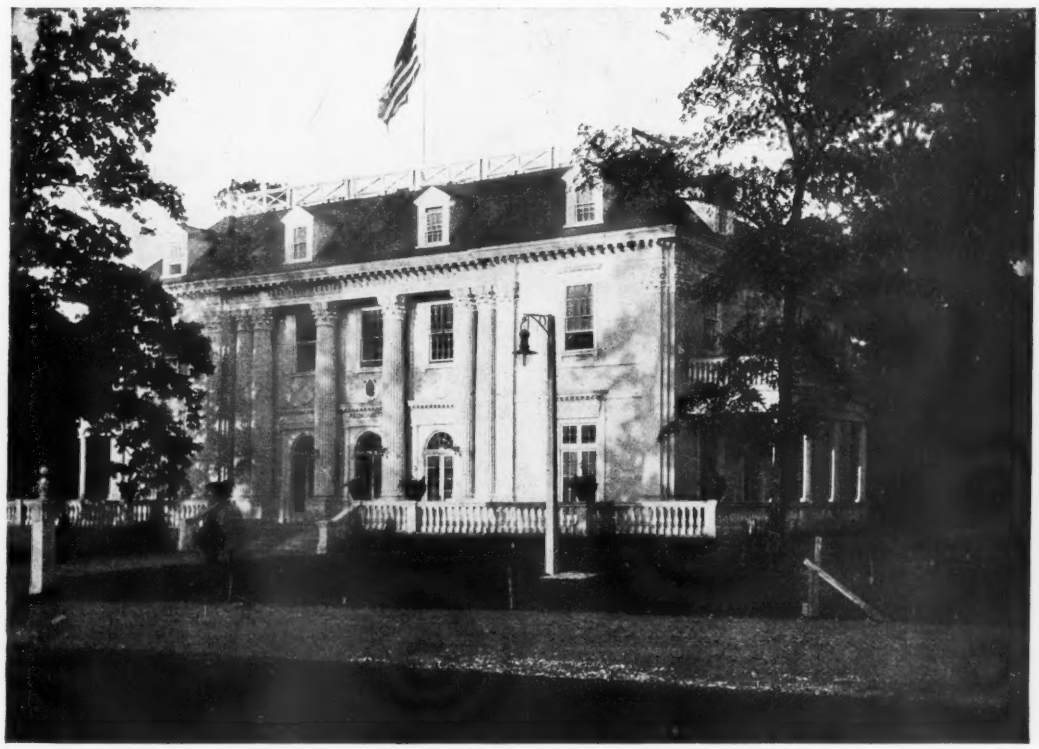
Iowa produces more corn than any other State, and is the first State in the Union in the value of its annual yield of oats, butter, poultry, horses, cattle, and hogs. It is the banner prairie State, and its Fair exhibit is worthy of its greatness.

The Dakotas, which form the northern boundary of the Louisiana Purchase, contribute a worthy share to the development of the section. North Dakota has no State building, but South Dakota has an attractive pavilion, with the dome frescoed with pictures made of corn, wheat, and flax, the chief products. The State's motto, "Under God, the People Rule," is made of straw. South Dakota has the famous Homestake Gold Mine, in the Black Hills. It is the largest gold mine in the United States.

COLORADO

Colorado makes the most elaborately arranged and beautiful exhibit in the Palace of Mines, for the State stands first in the Union in production of gold and silver, and has produced more than $847,000,000 in metals since 1859. There is a dull, gleaming pile of gold in the centre, near-by a heap of silver, and minerals of every hue, from the deep-blue of azurite to the sulphur yellow of carnotite, from which radium is obtained. So diverse are the mineral products of the State that this exhibit would make, of itself, an unusually good museum. The agricultural exhibit tells the story of the genesis of Colorado in a model of a prairie-schooner team. The rest of the display adequately disproves the comment of an English traveler in 1876: "Kansas is ugly, but good; Colorado is handsome, but good for nothing." Here are Rocky Ford cantaloups, a crop of which netted one farmer, in 1902, $250 an acre. Here are colossal potatoes—a basketful, for example, still remaining from 500 that weighed a ton. There are eight paying sugar factories in Colorado, using beets grown in irrigated soil which gives them a higher percentage of saccharine than any other beets grown in the country.

A model of Montana's capitol serves for its State Building. Montana's chief exhibit, however, is in the Palace of Mines. Gaze at the tall obelisks outside before you enter. The total amount of copper produced in the United States every year would make an obelisk eight times as large as these. Montana produces more than half of it, and, of the other valuable minerals, gold and silver. There is a tower of copper bars in the Montana section—part of the 40,000 pounds of copper exhibited—plates from electrolytic baths, which show how refined copper is secured, and costly representations in glass of some of the copper veins which Mr. Augustus Heinze and the Amalgamated Copper Company have had in litigation. They were prepared for use in court. An examination of the tangled veins explains why the lawsuits have dragged so long. Near-by is a relief-map of Butte and the surrounding mining district. It shows, in miniature, the buildings and smelters of the greatest copper mines in the world. Moreover, Montana shows the largest gold nuggets on exhibition at the Fair.



THE BEAUTIFUL COLONIAL BUILDING OF MASSACHUSETTS
A reproduction in part of Bulfinch's Massachusetts State House

THE NORTH ATLANTIC AND CENTRAL STATES

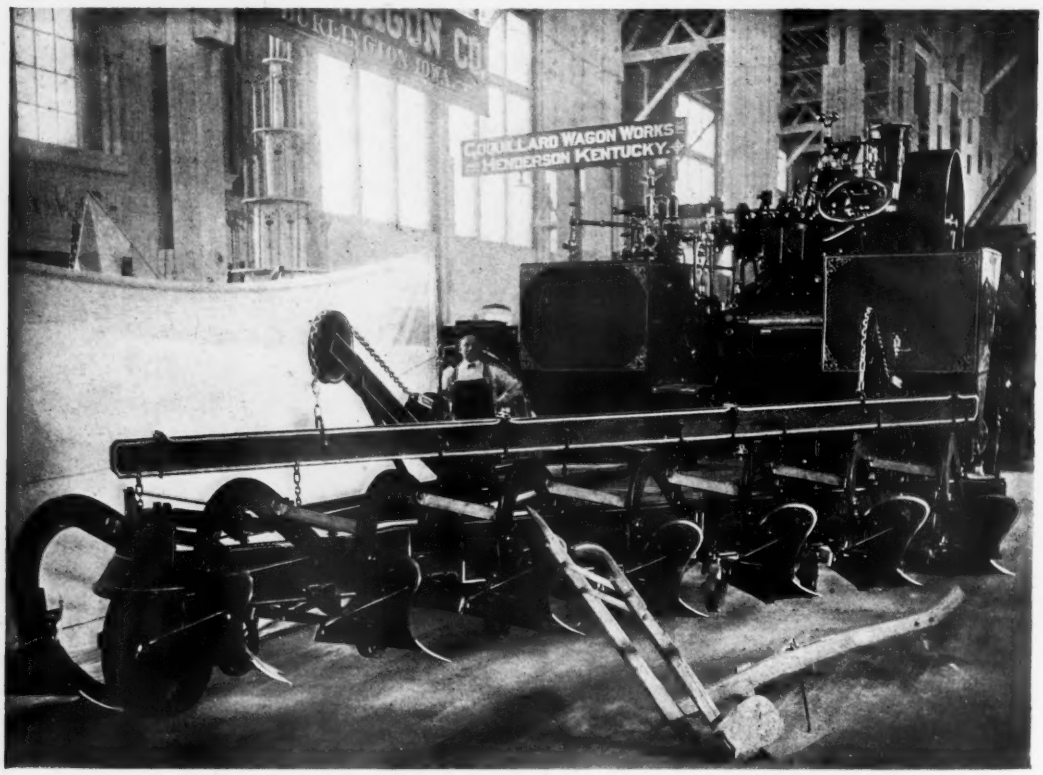
Worthy of the prestige of the Empire State, New York's display at the Fair is at once dignified and imposing. The State building, the third largest on the Plateau of States, is Italian architecture with Colonial treatment. A quadriga flanks the high dome. At the New York Building, a restaurunt is maintained for the exclusive use of New York citizens. It is the only State building having such a convenience. The tables are spread in the broad balcony near a grove of oak trees, and commanding a fine view of the State group, with the dome of the Government Building in the distance. There is no more pleasant spot at the Fair grounds than here. The food is cooked by electricity. On a large plot in front of the Forestry Building New York shows the work of her Forestry Commission in growing trees. In the Palace of Agriculture she displays the products

of her fertile Genesee Valley and the spoils of her rich Adirondack forests. And, in nearly every Exposition palace, there are the concrete proofs of a mighty industrial and commercial supremacy.

New Jersey has 2,000 miles of good roads—more than any other State. Six hundred miles are being constructed now. The State, however, is making a striking display of sea-food, principally oysters, and oyster culture. The State building is a reproduction of Washington's headquarters at Ford's Tavern, Morristown. Set amid some oak trees, it is picturesque and inviting. Wearied of the reputation of having the largest mosquitoes in the country, New Jersey shows the latest means by which they may be exterminated.

PENNSYLVANIA

The spacious halls of the $150,000 Pennsylvania Building are trod by more feet than the precincts of any other State. A never-ceasing crowd makes pilgrimages to the Liberty Bell, set up within the door, under guard of the stalwart policemen who brought it through cheering crowds from Philadelphia. It is a lesson in patriotism to see the people of every State in the Union flock in to gaze at the bell. "There's the crack," say the children, delightedly pointing. To left and right of the broad, uncarpeted hall are the largest rest-rooms at the Fair. There is even a commodious smoking-room, and a post-office where Pennsylvania visitors may get their mail. The general effect of the building is that of a state-house—it is large, and public rather than cozy. Naturally, coals and coal-mining processes, and the products of Pittsburg steel mills, make Pennsylvania's chief exhibit in the Palace of Mines, for, in the manufacture of steel, Pennsylvania leads the world. The big guns and armor plate shown here are the last word in naval armament. Yet, Pennsylvania reaps nearly $208,000,000 worth of farm products every year to the $183,000,000 her huge coal and iron and oil industries yield. Indeed, she tells the story of last year thus quaintly in her agricultural display:



THE WOODEN PLOW USED BY DANIEL WEBSTER ON HIS FATHER'S FARM, BESIDE A MODERN 8-GANG STEAM-PLOW

A VAST PYRAMID OF CORN
Grown in a prize contest by 8,000 farmer boys of Illinois

Old Brindle yielded, to those who milked her, $35,860,110.

The oil wells gave up to those who pumped them but $1,088,016.

The Little Hen turned out eggs to the value of $9,080,725.

The iron mines dug out but $1,890,100.

ILLINOIS

Illinois presents a solid, square structure in the architectural style of Louis XVI. Within, tiled floors give an air of coolness, and the outdoor spread of terrace and veranda is greater than any other State building offers, for Illinois is close to St. Louis, and it was a problem to furnish sufficient accommodations for the crowds. The hospitality offered is most cordial. The fifteen commissioners cut a Gordian knot by choosing their wives for hostesses; so the building has the unique distinction of possessing fifteen hostesses, two of whom are receiving all the time.

The Ohio State Building, an imposing semi-Colonial structure, is the only one on the Plateau of States containing a hospital. In the rotunda of the building is a striking portrait of William McKinley. The building is admirably appointed, the desire for comfort superseding all ideas of ornate decoration.

INDIANA

The favorite building-stone throughout the country is Bedford limestone. It all comes from a small area of Indiana. An exhibit of the stone in the Palace of Mines is accompanied by the best exhibit of soft coal there—one immense pyramid of it. In the Palace of Varied Industries, too, and in the Palace of Manufactures, an Indiana State exhibit challenges attention in competition with the private displays. Out of the $150,000 appropriated for demonstration at the Fair, the commission expended enough to bring together a collection of needlework and decorated pottery, the work of Indiana women. The Indiana Building itself has a really distinctive interior, in cool, subdued colors, most comfortable furniture, and stained glass. The agricultural display

ACRES OF APPLES FROM IOWA IN THE PALACE OF HORTICULTURE

presents a vast pyramid of corn topped with a figure of King Corn. And, within a section in which corn has been used in every conceivable way for fanciful decoration, are panels of pictures in corn-silk, barley-heads, wheat-straw, and other cereal products, illustrating scenes of farm life from James Whitcomb Riley's verses. The educational exhibit exploits the model schools of Indianapolis.

MINNESOTA

The Minnesota Building is thronged with visitors, because its open-latticed front shows an alluring room, which draws in the passers-by. It is more easily accessible than almost any other building. All the furniture in the main room was made by pupils in the high schools of St. Paul and Minneapolis. The State takes pride in its function as a food-producing section. Its exhibit in the Palace of Agriculture is crowned with a figure carved in butter—kept in a chilled glass case—of a woman feeding bread and butter to a child. Beneath is the legend, "The bread-and-butter State." A model of the Fayal open iron mine, in the Palace of Mines, shows the process of mining ore in a great iron-producing section. A striking model of the harbor of Duluth suggests the importance of Minnesota in the lake freight business. One of the great flour-millers of Minneapolis shows, in the Palace of Agriculture, the complete process of handling flour—all the way from wheat to bread. In the Forestry Building is a panorama of a Minnesota forest, filled with elk and other game.

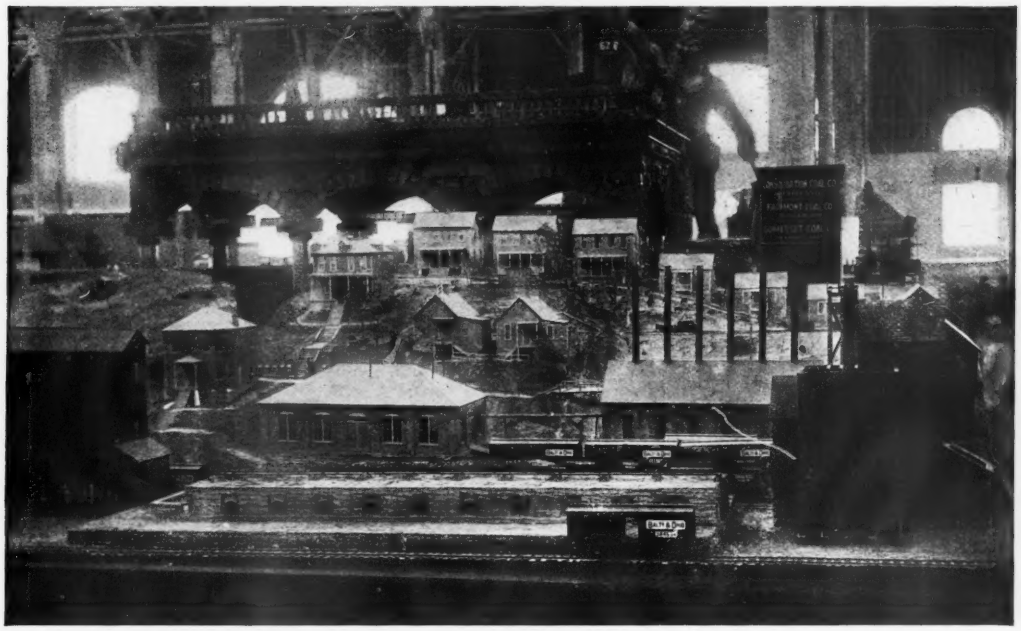
South of Louisiana's Cabildo is the quaint old English villa of Wisconsin, with plaster walls crossed with wooden braces, and a broad and cozy veranda. Its Wisconsin visitors seek the agricultural buildings and the live-stock barns for the typical Badger exhibits. The life-size milkmaid and cow wrought of butter in the dairy exhibit tell the story of the State's distinction since its forests began to disappear in the pulp-mills, for Wisconsin is the preëminent dairy State, though there is forest enough left to provide for one of the best exhibits of woods in the Forestry Building.

Guided by the State university experts, the farmers of the State have developed dairying to a science. It has been demonstrated that if the farmers of the country adopted the Wisconsin milking methods they would increase their profits one hundred million dollars a year. The State building itself, however, in an odd bit of furniture, calls attention to a little-known Wisconsin industry. It is a desk, valued at $20,000, inlaid with mother-of-pearl, which comes from the Wisconsin River and the Rock River in the southern part of the State. From these rivers and from the Mississippi are fished the clams that provide the pearl buttons and other mother-of-pearl articles of the country. That the State provides good manufacturing sites is shown by a map, in the Palace of Mines, of the water-courses. Its educational exhibit includes illustration of the best public schools in the world—those of Menomonie.

MICHIGAN

The Michigan Building is conspicuous because it offers the cool sweep of its broad verandas to the crowds of sight-seers who

A DISPLAY OF NEBRASKA APPLES



ALABAMA'S HUGE IRON VULCAN IN THE BACKGROUND, INDIANA'S ARCH OF SOFT COAL IN THE MIDDLE DISTANCE, AND IN THE FOREGROUND A MODEL OF SUCH COAL MINES AS ARE FOUND IN WEST VIRGINIA, MARYLAND, AND PENNSYLVANIA

pour from the door of the building containing the Government's aquarium. In Michigan is manufactured more furniture than in any other State, and, naturally, the building is furnished with Grand Rapids products—extremely comfortable chairs and substantial tables. The State's iron and copper mining is presented in the Palace of Mines, and the reason why Michigan apples have a reputation outside the State is shown in the Palace of Horticulture.

THE SOUTHERN STATES

Closely allied, geographically, with the territory of the Louisiana Purchase, the Southern States have contributed to and shared in the upbuilding of the country.

Kentucky, which stands at the gateway to the South, hospitably greets her visitors at the Fair in a stately building on a hill overlooking the Palace of Mines. In the rotunda is a statue of George Rogers Clark, the intrepid empire-builder of the Great Northwest. But, while Kentucky dispenses her famed hospitality at her State building, she is showing the evidences of a notable development. When the State was asked to make a display at the Fair, it was found necessary to decline on account of a depleted State treasury. The people wanted a display of their resources. They organized the Kentucky Exhibit Association, and raised enough money to build a handsome structure. It is typical of the new State spirit. Then the State appropriated enough money to furnish it. Kentucky has the largest asphalt-beds in the United States. She produces enough asphalt to make a road around the world. Kentucky grows more tobacco than any other State, and the exhibit of this product in the Palace of Agriculture emphasizes her greatest commercial activity. Her chief city, Louisville, is the largest tobacco-market in the world. With hemp, Portland cement, building-stone, coal, and pottery-clay, Kentucky displays advantageously the products that are fast giving her a new industrial prominence.

Maryland's State Building, which adorns one of the avenues of the Plateau of States, is a roomy Colonial structure. Over the mantel is the roll of honor of the State's distinguished sons, including Edgar Allan Poe and Johns Hopkins. On one of the walls is a portrait of Francis Scott Key, the author of "The Star-Spangled Banner." The first piano made in this country stands in the corner.

THE ILLINOIS BUILDING
With its wide terraces and roof verandas

Virginia, the home of Thomas Jefferson, whose genius and foresight consummated the Louisiana Purchase, entertains her guests in a reproduction of his famous home, Monticello a building (designed by Jefferson), with high, cool halls, and spacious rooms. In the rotunda stands the statue of Jefferson from the University of Virginia.

North Carolina now has more cotton-mills than Massachusetts. A collection of cotton cloths and woolen blankets emphasizes the striking advance the State has made in manufacturing. There is also a display of silk cocoons. But the progress has not all been industrial. For example, North Carolina shows many kinds of building-stones.

Patriotic sentiment and a spirit of commercial progress are mainly responsible for Georgia's exhibit. Boards of Trade and individuals united for a display that shows the State's products, principally cotton and syrup. In the Palace of Agriculture, a genuine Southern Negro mammy serves Georgia syrup on Georgia corn-cakes. The State building is a reproduction of "Sutherland," the home of the late General John B. Gordon, at Kirkwood, Ga.

The State of Alabama made no appropriation for an exhibit, but the enterprising Commercial Club, of Birmingham, used a very large sum to show the characteristic mineral wealth of the region round about it—a wealth that has made that young city one of the very foremost centres of activity in the South. Iron and coal are the basis of the wealth of that region. The happy idea was carried out of molding a colossal figure—"Vulcan"—of iron. It stands in the Palace of Mines, overtopping every other exhibit.

Beauvoir, the home where Jefferson Davis lived his last years and died, is reproduced as the Mississippi State Building. The rooms are furnished with rich old mahogany furniture, including the bed on which the president of the Confederacy died. One remarkable thing of the State's agricultural products is that they embrace everything needed by the people of the State.

Across from the Georgia Building is the reproduction of The Hermitage, the famous home of General Andrew Jackson, ten miles from Nashville, Tenn. It is the Tennessee State Pavilion. It was built by private subscription, the State having failed to make appropriation for this purpose.

As Texas is the Lone Star State, her State Building is like a star, with a tower in the middle. Texas resources are best summed up in the very original State exhibit in the Palace of Agriculture. It is a small train of cars, loaded with the State's chief products—corn, wheat, rice, and oil. A cattle-car is attached.

THE NEW ENGLAND STATES

New England's contribution is distinctive. Here is our Colonial and historical aspect to offset, in the drama of the United States, the lusty expansiveness of the Louisiana Purchase States and the West. The Massachusetts Building, with its Colonial outlines and Bulfinch façade, recalls old Salem and old Boston. In the Palace of Educational are presented the results of the public spirit of the State, which make it the best-ordered community in the world—the factory-inspection system, the park arrangements, the educational activities, the public library equipment, the provisions for public health. And it is

THE NEW YORK STATE BUILDING
One of the most imposing on the Plateau of States

TYPES OF SCHOOLS NOW IN USE IN COLORADO

From the sod-and-log cabins to the elaborate brick-and-marble structures

surprising to learn, in the agricultural exhibit, that Massachusetts gets a better oat crop to the acre than Iowa, and a better tobacco crop to the acre than any other Northern State.

Maine's log-cabin hunting-lodge, set among the oaks on the slope above the Mining Gulch, is redolent of big woods that teem with game and fish. Its trophies of rod and gun, here and in the Forestry Building, suggest a sportsman's paradise. Potatoes form the exhibit in the Palace of Agriculture

New Hampshire is represented by a reproduction of Webster's birthplace, and Vermont by a typical New England farmhouse. Their exhibits spell home to many a western farmer, who glories in the rocky hillsides of his boyhood no less than in the fruitful prairie farm of the State of his adoption.

Rhode Island offers a sharp contrast to the white-and-ivory buildings of the other States in its row. Its building is a replica of a "seam-faced granite" Colonial house in the town of Lincoln, the original of which was built with a prize from the old State lottery. The interior, following other Colonial models, is simple, beautiful, and inviting. No State building is more hospitable—lucky is the visitor who enjoys the cool delights of the distinctive "cyclone cellar."

The Connecticut Building, a beautiful Colonial mansion, fitted, even to bedrooms, with antiques, and filled with articles of deep historical interest, sums up the best American tradition in beautiful and civilized living. It is the only completely and charmingly furnished home at the Fair—and nothing there is better worth seeing. It contains one pathetic memorial in a portrait of the late Richard Henry Stoddard, left with hands unfinished, because Stoddard died before the sittings were finished. Shade-grown tobacco and manufactured articles are Connecticut's most characteristic outside exhibits.

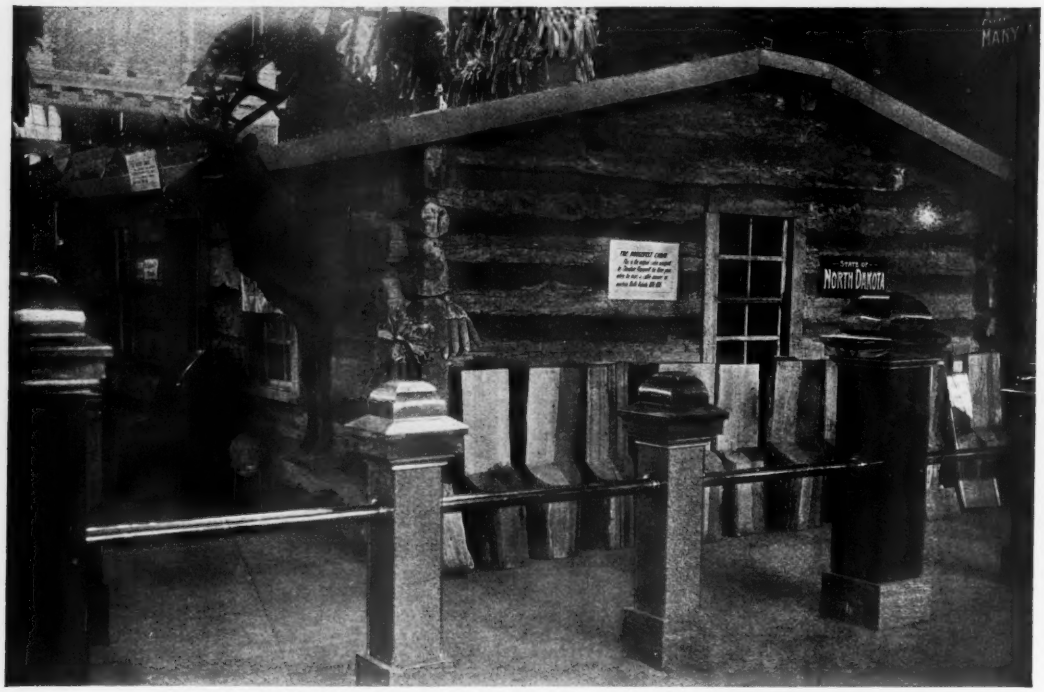
THE WEST AND THE TERRITORIES

If you climb a short flight of stairs in the Palace of Agriculture you may gaze down

on a lifelike panorama of the "Utah Valley." In the foreground, irrigated grain is growing. Back where reality merges into painting are irrigated farms running off into alkali deserts with the snow-capped Wasatch Mountains behind. Irrigation, then, tells the agricultural story of Utah where wheat and sugar-beets and alfalfa of improved varieties are grown and fruit orchards bear abundantly. The State is now planning to dam the Jordan River and use the Utah Lake as an irrigation reservoir against the dry season.

Utah's building is a cozy little yellow structure opposite the Inside Inn. In outside exhibits, you find a novel and remarkable school system, in which the pupils' lessons begin with household objects, and annually widen in scope to the garden, the farm, the town, the county, the State, the nation, and the world. In each year, the three R's and all the other studies bear on the field under study. You find in the Palace of Mines brine and salt from Salt Lake, and valuable Utah minerals—carnotite, for example, containing radium, and so radio-active itself that a piece of the crude ore will photograph objects on a sensitive plate. The State shows a marvelous vitality in developing its resources.

Idaho has chosen to build a cool little Mexican building with brick floor, and open, central courtyard, planted with grass and trees. The rooms are small, but among the coziest of the State apartments. An extremely interesting collection of Indian basketry, weaving, and pottery not only provides an exhibit, but also furnishes the interior decoration. Colossal potatoes and sugar-beets show in the Palace of Agriculture how irrigation has made the State fertile, and its mining exhibit is a treasure-house of valuable ores.



THE CABIN IN WHICH PRESIDENT ROOSEVELT LIVED WHILE IN NORTH DAKOTA

New Mexico's building is built after the style of an old Spanish mission-house, with quaint mission furniture in every room. As minerals and stones form her chief products, she makes a display that embraces all varieties. Notably beautiful are the turquoises, which are shown in profusion. Gold, silver, copper, and zinc are included in an exhibit that symbolizes a constantly increasing activity.

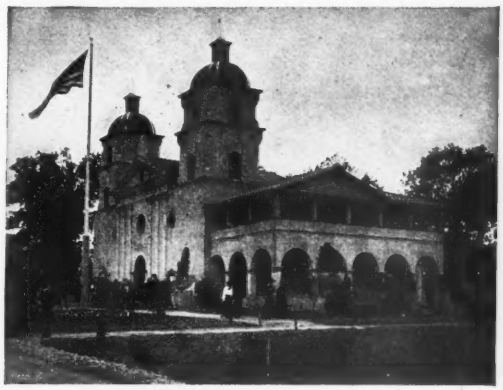
Wyoming and Nevada spread out the evidences of their mineral and agricultural wealth, and Wyoming calls attention to the

fact that 1,000,000 more people could find homes and livelihoods within its borders. Nevada's array of alfalfa tells the latest chapter in a history of quick development, of which a plow roughly wrought from the wagon-tires of prairie-schooners connotes the first, for this plow turned the first furrows of the original settler.

Arizona's exhibit has a strangely foreign suggestion. The Arizona Building, though American within, recalls the better kind of Mexican adobe-house; and the agricultural display, except for the colossal size of the products, might have served for a sample of Mesopotamian activity 3,000 years ago. Date palms are growing within the section, and dates are exhibited which show that date-growing is now being carried on by Arizona farmers successfully. There are huge lemons from Yuma, grape-fruit, olives—backed by bottles of olive oil, put up in Phoenix—navel oranges each weighing more than twenty ounces, plums and grapes, and ostrich plumes from the largest ostrich farm in the United States. The strongest hint of the method by which these are produced is given by the model of the Tonto Basin Reservoir in the Government Building—with seven times the capacity of the Croton Reservoir outside New York City, yet built at one-third the cost. For, though Arizona exploits its wonderful mineral resources in the Palace of Mines, the new State is fast becoming an agricultural community through the spread of irrigation.

ALASKA

Alaska is no Arctic wilderness. Its building, near the Indian Village, is not only a frequented rest-house—where other visitors far outnumber Alaskans—but an exhibit of surprising resources and efforts. Built as wings to the main square structure are reproductions of Alaskan Indian houses—with slab sides, and roofs supported by beams hewn from tree-trunks, actual Alaskan buildings of fifty years ago torn down and brought here. Grotesquely carved and painted totem-poles stand outside. Within are exhibited nuggets and golden sands from Nome, specimens sent by the Alaska Academy of Sciences, and an unexpected array of grains and fruit and vegetables grown beyond the Arctic Circle. Near them are the fruits that grow wild in the North, huckleberries, pale salmon berries, and great crimson strawberries. Beyond the dog-sleds and Yukon canoes are the piles of fur they have carried. But the civilization of Alaska arouses the greatest surprise. In the main building, upstairs, the courteous hostess points out the photographs of classes in the public schools of Nome and Dawson, Juneau, and Skagway. Beside them are specimens of the children's school work. There is a picture gallery of work of Alaskan painters. Exhibits of sewing suggest the domesticity of the members of Alaskan women's clubs. Alaska adds millions every year to the national wealth; it is rapidly gaining in railway mileage, in the output of its mines and placers, in its production of timber, fish, and furs. This progress is shown in various exhibits.

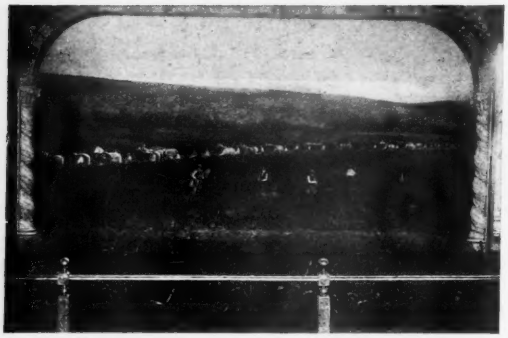


A PICTURESQUE PAVILION
California's State building is patterned after the old Spanish missions

THE TOTEM-POLES OUTSIDE THE INDIAN HOUSES FORMING THE WINGS OF THE ALASKA BUILDING

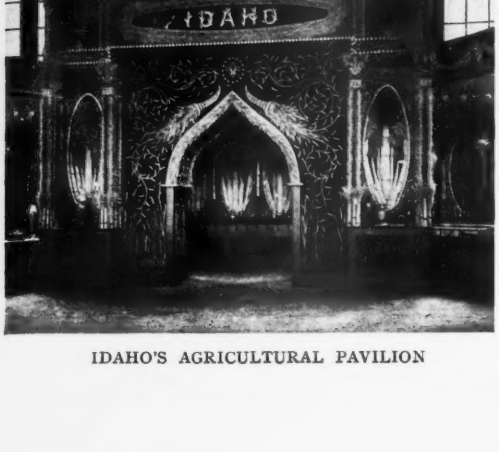
WASHINGTON

Just beyond the Fisheries Building, its pointed top 100 feet from the ground, is a wooden building that looks like a Chinese



A MISSOURI CORN-FIELD PICTURED IN CORN

pagoda stripped of ornate trimmings. Beams of wood 110 feet long rise from the ground like the poles of an Indian wigwam. In this building, which is the Washington State Building, they meet at a point and form the apex of a very striking piece of architecture. The wood was furnished by the Lumbermen's Association of Washington. Inside, Washington's resources and products are displayed: woods from the dense forests (Washington last year manufactured more shingles than any other State); fruit from her large orchards; wheat, corn, and hops from her ample fields; coal from her rich mines; and fish from her extensive salmon-canning industry. The office of the Washington State Commission is in the trunk of a fir-tree 12 feet in diameter. With the characteristic spirit of commercial achievement of the Northwest, Seattle and Spokane make effective displays. They show how thriving cities have grown from villages in less than a quarter-century, and how the spirit that makes this possible is the spirit that is developing the empire of the Northwest. It has linked our commerce with the commerce of the Orient, and it has opened up a great trade with Alaska.



IDAHO'S AGRICULTURAL PAVILION

Every twenty-four hours 1,000,000 feet of lumber are sawn in Portland, Oregon. The State pavilion is of wood, therefore, and is a reproduction of Fort Clatsop, the log blockhouse occupied by Lewis and Clark on their famous Northwest expedition in 1805. The logs are Oregon pine. The flags of nearly all the great nations of the world fly from poles made of Oregon fir. One is on the Kaiser's yacht. Every year, Oregon grows 85,000 bales of hops and 20,000,000 bushels of wheat. The value of the dairy product last year was $4,595,000. With more than 600,000 Angora goats, Oregon produces more than 460,000 pounds of mohair every year. Oregon's development is typical of the development of the great Northwest.

CALIFORNIA

California welcomes to a comfortable gray building, constructed in imitation of the old Spanish mission at Santa Barbara, the citizens of all States, with lavish hospitality. It is like a visit to California to step within the shady porticos. And in forestry, mines, horticulture, and agriculture, the State exhibits more varied and tempting products than any other State. California produces practically all of the raisins and most of the oranges, lemons, prunes, and olives used in the United States. But the agricultural exhibit exploits more than colossal fruits and high-piled tiers of olive oil in bottles. There are wines, fish, grain, and vegetables. Some of the triumphs of Luther Burbank, the wizard horticulturist, who lives at Santa Rosa, are shown—the Burbank potato, now grown everywhere in California; the pineapple quince; sugar prunes secured by a cross between French and Hungarian prunes. The potatoes are more than a foot long, and white and mealy. A California law permits the counties to appropriate money for advertising, and, accordingly, the State display is made up of many county displays, one vying with another. There is a huge bear made of prunes in front of one county's exhibit, and an elephant in walnuts before another's.

And long as this recital is, it does not hint at one-tenth of the abundance of wonderful things the States show at the Fair.

THE EXHIBIT OF PICTURES AND SCULPTURE

BY

CHARLES H. CAFFIN

THE spaciousness of the galleries has made it possible to hang the pictures of the American exhibit without crowding, and the general effect is admirable. Whistler's "Rosa Corder," which occupies the centre of one of these long walls, could scarcely be seen to better advantage in a public gallery; nor could Sargent's large portrait of the three "Misses Hunter." Both of these pictures are among the best works of these two great masters in American art; both painted with consummate skill, the one illustrating Sargent's marvelous grasp of the actuality of externals, the other Whistler's power to suggest the mystery inherent in the fact; the mystery of character and that, too, of visible appearances, for the figure of the lady is already enveloped in the dim, uncertain atmosphere that obscures the distance into which she is receding from us.

Both of these portraits represent a standard so high that we can hardly be surprised if it is not generally maintained. Nevertheless, there are other notable examples in this American section. Wilton Lockwood's "Portrait of ex-President Cleveland" is one, and we shall appreciate its sterling qualities all the more if we happen to have seen the portrait of the same subject by the Swedish artist, Anders Zorn. For, instead of the rather brutal assertion of bulk and physical force which the latter represented, Lockwood, without extenuating these characteristics, has added a suggestion of intellectual power, and, by placing the figure in a misty atmosphere, has balanced the physical with a mental preponderance. Another Boston artist is well represented—F. P. Vinton, whose portraits are not excelled in this country for downright masculinity, for the qualities of manhood and strong character that he renders in his subjects. Another portrait painter of exceptional strength, the Philadelphian, Thomas Eakins, can be studied here to good advantage; for example, in the "Physicist, Professor Rowland of Johns Hopkins University." People on the lookout for "pretty" pictures will hurry past it; those, too, who seek artistic beauties of line, color, and lighting will not linger in front of it; but to anyone who is content to estimate a picture by what the artist has put into it, instead of by what he has left out, this slouching figure, with the hands thrust energetically into the trousers-pockets, and the head bowed in thought, as if the man were pacing up and down the room in pursuit of the solution of some problem, will represent a marvelously faithful human document.

A figure-subject, which has some suggestion of being a portrait, is "A Poet of the Montmartre Type," by Henry S. Hubbell. The man is seated at a café table; a fellow with well-cut features and considerable refinement of expression, but with an untrimmed black beard, and a soft hat above his bushy hair; giving, in connection with his loosely fitting suit and limp cravat, an air a little brigandish and very shiftless, a characteristic blend of mental vivacity and of physical and mental softness. Another extremely interesting picture, also by an American resident in Paris—Arthur Johnson—represents a nude woman sitting on a slope of grass, her figure showing very white in the shade, while through the foliage of a tree with gnarled trunk and twisted branches streams the sunlight. It kindles into brilliance patches of red and purple flowers that lie around her like scattered gems, and converts into a shower of gold the blonde hair which streams about her head; while the chance shade of a leaf puts her eyes in shadow.

Imagination also, but perhaps of a higher order, while certainly as reliant for expression upon the possibilities of color, is exhibited in "The Mystery of the Night," by T. Humphreys Johnston, another of the painters who reside in Paris. The deep blue of sky and sea is luminous with the pale light of a hidden moon, which whitens the curls of the water as

it laps against the rocks, and glimmers upon a female figure, standing immobile as a statue, the head shrouded in a thin veil which partly wraps her form. A spirit in bodily shape, or a human being spiritualized—whichever way we regard it, it is an expression of the stillness and isolation that one experiences in the infinite peace of a summer night, the mystery of apparently suspended reality when all about us is only invocation to the spirit.

Two of the men who are accounted leaders in American landscape, George Inness and Homer Martin, seem not to be represented here, while a third, Alexander Wyant, has only one example to his name. The omissions are unfortunate, since the occasion would have been a good one for thousands to have made acquaintance with the work of men who must be known by every one who seeks an adequate comprehension of American landscape painting. Nor is there more than one example: "Autumn," by Ralph A. Blakelock, who, like the three just mentioned, has passed into the great Beyond. He is their inferior in technique, but their equal, at least, in depth and beauty of imagination.

Again, foremost among living American painters, by reason of his bringing technical skill to the service of an imagination that is profoundly dramatic, is Winslow Homer, who, separating himself from men and manners, lives the life of a recluse upon the Maine coast, with the power and majesty of the ocean continually before his eyes and in his brain. His ability to realize these qualities in his pictures may be studied in two examples—"Early Morning" and "Weather-Beaten"; yet they scarcely represent him at his best. If I mention these omissions and weaknesses in the present exhibition, it is for the information of the many who, perhaps for the first time, are brought face to face with a large collection of American pictures, rather than in criticism of those who have gathered it together, since no one, except the ones immediately responsible, can form any idea of the innumerable difficulties which bristle up to thwart their plans and restrict the scope of their intentions. And the present exhibition, even with its limitations, is probably the most truly representative one that has yet been made. If so, it is because, more than heretofore, it reflects a wide territorial range, including strong work from the West and Middle States, as well as from the East, and also from Americans residing in France, Holland, England, and Italy. Moreover, it takes account of a larger number of the younger artists who are stepping up to the front.

THE AMERICAN SCULPTURE EXHIBIT

The single example by Saint-Gaudens, our foremost sculptor, is a plaster cast of his famous statue of "The Puritan," the original of which is in Springfield, Massachusetts. Stubbornly angular and assertive, it is an extraordinary epitome of the grim determination and bigoted self-assurance that blazed a path for freedom. High above it is a reproduction of the equestrian statue of Washington which was presented, by popular subscription, to the city of Paris, and now stands in the Place d' Jéna. The horse is by Edward Potter; the figure by Daniel C. French, a cast of whose recent work, a figure of "Alma Mater," for Columbia University, is also to be seen here. But more interesting than this is his colossal figure of a "Working Man." His powerful figure bared to the waist, he sits upon an anvil, snatching a moment's interval from physical toil to pore over an open book. The action of his hands and arms as he holds it, and the expression of calm absorption in the face, are admirable.

Another subject of labor is "The Driller," by Charles H. Niehaus, a statue which adorns a memorial at Titusville, erected in honor of Drake, who sunk the first oil-well in Pennsylvania. Being among the best examples of nude sculpture in this country, it may be compared with "The Hewer," by George Grey Barnard, one of a series of statues intended to symbolize the growth of civilization. In correspondence with the speculative and dreaming bent of this sculptor's mind, his statue has more of the abstract and the ideal than the other one.

As an expression of ideal sentiment, "The Kiss of Eternity," by R. P. Bringhurst, is an excellent work, the winged angel and the dead youth being composed into a most decorative group, while the feeling suggested by the treatment is tender and exalted.

Of special interest are those works which have been inspired by Indian and western life. "The Medicine Man," by Cyrus E. Dallin, is one of these, which is not only admirable in the physical facts of the horse and its rider, but interpretative also of the spirit and traditions of the race. Nor should this sculptor's

statue of a Sioux chief, which stands upon one of the bridges in the West Court, be overlooked. The group of an old Indian and boy, "The Sun Vow," by H. A. Mac Neil, is an illustration also of the sculptor's power to reach into the heart of his subject, while "The Ghost Dance," by Paul W. Bartlett, has equally a double value, rendering, in the hopping movement of the figure, the individual characteristics of the dance, and, in the expression of the face, the curious psychological condition of the dancer. Of the western life, Solon H. Borglum is the best interpreter in sculpture. "Our Slave," "On the Trail," and "Lame Horse" appear in the Palace of Art, while outside in the grounds are two fine examples of his work—"Cowboy Resting" and "Pioneer in Search of Water." His brother, Gutzon Borglum, is represented by a very spirited group, "The Horses of Diomede," a most remarkable exhibition of infuriated action.

THE EXHIBIT OF HOLLAND

In its homogeneousness of character, as well as in its high standard of technical accomplishment, the exhibit of Holland is preëminent. Two facts strike one at the outset: that these painters thoroughly know their craft, and that the subjects which interest them are the ones close to their ordinary life. They excel both in oil and water-colors; and they occupy their brushes in the representation of the streets and wharves of their cities, the meadows and canals within a few minutes' walk of their homes, and the simple scenes of peasant life; portraiture, of course, having its place also in their range of subjects.

They are continuing, in fact, the traditions of their art which were established firmly in the seventeenth century.

Amid such a prevalence of good work it is difficult to specialize, but one name will occur to every student of Dutch art—that of the veteran Josef Israels, who was the first to catch the inspiration of Millet. You may study him in one of his vigorous moods, as in "The Skipper." There are signs of storm in the sky; the vessel has been beached; the sailors are climbing down the sides on to a horse, while the skipper rides ahead of them through the surf, welcomed by his dog. How the spirit of the scene, as well as its appearance, is suggested! Again, what an acceptance of the thing as it really happened is represented in the picture of two old men "Eating"; and here, as in "Saying Grace," we get an example of Israel's mastery of effects of atmosphere. Most remarkable, however, of all the pictures here is "The Old Scribe"—dry and shrunken through sedentary habits, his supple hand holding the pen with the poise and steadiness of long practice.

Three examples stand to the name of the great marine painter, Hendrik W. Mesdag, of which especial mention may be made of "Summer Morning," with its exquisite rendering of warm, vaporous air upon the ocean.

One would like to dwell at some length upon the landscapes, but we must confine this notice to those which seem to be especially memorable, "Autumn Night," by Bernard Höppe, a canal scene, with barges moored along the bank, a windmill starred against the evening glow, and a spire in the distance rising above the village. As bracing as the latter was soothing is Louis W. Van Soest's "The First Snow," a magnificently virile picture. Lastly, there is "A Quiet Corner in Laren," by Frans A. Langeveld; a little orchard, shut in from the world by farm buildings, over the tops of which a row of trees, following probably the line of the high road, is softly silhouetted against the sunset sky. The orchard is still flecked with patches of yellow light, and, across it, a man is wheeling his barrow after the day's work. Whether studied as a whole or in detail, it is found to be beautifully painted, while the sentiment that it exhales is sincere and lovely.

THE FRENCH EXHIBIT

Neither excellence of painting nor sincerity of artistic conviction is too prevalent in the French section. Many of the pictures represent the display that is necessary to advertise their authors in the annual salons, while others exhibit the poverty of merely technical skill. But there are memorable exceptions.

L'hermitte is represented, among other canvases, by his "Death and the Wood-Cutter"; the subject taken from "Æsop's Fable" of the old man, who, burdened by his load of faggots, prayed for the release of death, but who, on the appearance of the grisly spectre, at once shifted his prayer to one for a continuance of the lighter evil. Another sympathizer with the life of the toilers, Charles Cottet, a powerful painter of very dreary subjects, sends the "Old Horse," a worn-out slave of a

gray horse, nibbling at the scanty grass upon the edge of a cliff; and that triptych in which he has represented the tragedy of the fishing life on the coast of Brittany. In the center panel the fishers and their wives are gravely taking their last supper; while the one on the left shows the men at their occupation on the sea, and the right-hand one the women watching from the land. Not a whit more attractive in the popular estimation of "pretty" is the work of Lucius Simon, whose "Strolling Circus" is hung here. From a painter's point of view, however, it is very powerful work, while one not learned in such matters may still enjoy the extraordinary shrewdness of character study developed in the pose of the figures, the expression of their faces, and even in the carriage of their hands.

Of an entirely different motive is the work of those men who have made the rendering of light, and particularly of the various phases of bright sunshine, their chief study. The late Lucien Pissarro, the oldest of them, Claude Monet, their recognized leader, Alfred Sisley, now dead, Guillaume Seignac, Maxime Mañfra, and Henry Morel are all represented by landscapes and Pierre Renoir by a face.

These two divergent points of view, the one looking toward what is most full of character and rather on the cheerless side, the other escaping into the actual freedom of light, represent the two most vital influences in France today.

THE GERMAN EXHIBIT

It is an unfortunate circumstance that the most progressive and original coterie of German painters—that which is known as "The Secession"—is not included in this collection. A considerable space is occupied with enormous official canvases, painted by imperial order, interesting sometimes historically, as in the group of portraits of the diplomats attending the Berlin Conference, but, from an artistic standpoint, without much claim to serious attention. Sandwiched in, however, are many creditable paintings, with subjects of a kind to attract the interest of the visitor, for the Germans are preëminently fond of painting incidents or of embodying ideas.

Yet if we are looking for some feature of distinctive interest, we shall pass out of the galleries containing paintings into the one that displays the lithographs. A very interesting revival has taken place in Germany of this medium of art, which not only permits of original expression on the part of the artist, but brings his work within the reach of many. A far more striking exhibition might have been made but for the complication which estranged so many of the Munich men. As it is, the most remarkable showing is made by Georg Luehring in a series of subjects which illustrate the fecundity and the weirdness of the German imagination.

THE BRITISH EXHIBIT

Special efforts were made in Great Britain that this exhibit should be an exceptionally good one, and they have been successful. Among its most interesting features are examples of the work of Sir John Millais and Sir Edward Burne-Jones. Both are dead, and were, in a way, antipodes of character, the former having the bluff heartiness of a country gentleman fond of sport, and the latter being a dreamer who sought his ideals in an imaginary past. Millais' landscape, "Chill October," is one of his most famous works, a marvelous product of intimate observation; but even more unquestionably a masterpiece is his portrait of a brother artist, J. C. Hook, a painter of the sea. The subject himself has a physique of magnificent impressiveness, so commanding and wholesome, and nothing could exceed the virile directness with which it has been rendered. Millais, at one period of his extraordinarily popular career, sank below his best, wherefore it is very satisfactory for the sake of his memory that this proof should be produced of how intrinsically great a painter he really was.

That the tradition of great portraiture still survives in Great Britain is assured by the "Portrait of Sir Walter Gilbey," by the Scotch artist, W. Q. Orchardson. Here is a characteristic type of English gentleman, fond of horses and horsey in his costume, but a man also of shrewd intellect and polished tastes; and how admirably the complex qualities are suggested in the picture! It is a veritable human document, painted with magisterial assurance.

But at the opposite pole from the directness of these two portraits is the work of Burne-Jones. He illustrates the Englishman's fondness for the embodiment of an idea in a picture, but in a way far more profound than even Leighton himself. In the examples of the latter's works exhibited here there is a

perfection of outward refinement, but in Burne-Jones's an impenetrable depth of suggestion that seeks expression in a tentative, almost pleading, way. He projected his imagination into the old days of Celtic legend, into a world very bleak, in which certain types of men and women blossomed like rare flowers. It was an age of the world virginal as compared with the present, and such was the manner of his art. It should be studied here not only in the two oil-paintings, but also among the pencil drawings and water-colors.

THE JAPANESE EXHIBIT

Of the three picture galleries in the Japanese section, one contains oil-paintings. These are by men who have studied in Paris, or by their pupils, and represent a phase of modern movement in favor of the adoption of western methods. It is not here, however, that the true genius of Japan is exhibited, and to discover what painting implies to the Japanese mind, and how it has been made a means of expression characteristic of the ideals of the race, we must study the water-colors in the two other galleries.

In the first place, the use of the latter medium has come down to the modern artist through a long period of time, generation after generation of pupils having "sat in the gate of the master," so that there is a fine tradition of painting to which each successive age can adjust itself. The painter in oils, however, has cut himself loose from this. Furthermore, he has separated himself from the motives as well as from the methods of his own art. For the motive of Japanese painting is not one of representation, as ours is, but of suggestion. The artist, for example, in painting a tree or a mountain, is not seeking to deceive you, as he would, say, into the belief that it is a real tree that you are looking at, but to give you an impression of the relation—generally a decorative one—which the object bears to the rest of the picture, and of the sentiment with which the scene inspires him and, he supposes, will inspire you.

As compared with our notions, therefore, Japanese painting is a stenographic art, or, to speak more accurately, an ideagraphic one, symbolizing the object painted. It has grown out of and conformed itself to the preference which the Japanese have for the abstract over the concrete, and their tendency to consider the end in view—the expression, that is to say, of what will stir the soul by its beauty—of more importance than the objects selected to embody it. And, as the expression is primarily conveyed by technical means, they have fostered a skill of craftsmanship in drawing, and in the arts of modeling, carving, lacquer-painting, and the decoration of porcelain and pottery, which is unsurpassed. This being so, it is very gratifying to observe that the present exhibition indicates that the Japanese fully recognize how unique their art is, and that its future must follow the direction of their own traditions.

The artist who more than any other has been instrumental in arousing Japanese art from the lethargy into which it had fallen by the middle of the last century, and in preserving it from western innovations, is Hashimoto Gaho. A deep student of the past, he does not believe in merely copying the old methods, however admirable they may have been, but he uses what he has learnt from them to express what he calls "Kokoromochi." This, as nearly as it can be translated into our words, seems to mean the vital character or essence of the object painted, which motive is not so dissimilar in a general way to that of our impressionists.

Since Hashimoto Gaho is recognized in Japan as the great master among the moderns, the visitor will do well to study these six pictures, which were painted especially for St. Louis, and use them as a test of comparison with the work of the other men, and also as a clue to the understanding of the whole exhibit. The student of Japanese art will find these pictures very beautiful. To one who is a stranger to it, none of them will be more readily comprehensible and enjoyable than "Winter Morning and Wild Ducks." The sun is mounting, a disc of pale luminosity in the vaporous sky, against which the distant reeds present a faint and mysterious labyrinth of lines. Those nearer to the front shiver in the rising air, spiking it with their long leaves. They have lost the grace and suppleness of life, and rise out of the snow like spectres, distorted, dry, crackling their joints. Three of the ducks in the middle distance seem to be still roosting; in fact, all through this part of the scene there is a suggestion of suspended animation. But in the sky the light is stirring, and in the foreground is the main flock of birds. They stretch their legs, preen their feathers

and one has slipped into the water. But they utter no sound; they are not yet lively, they are still a part of the isolation and stillness which prevails around them.

Perhaps by this time we have reached the threshold of the artist's mind, and can peer in and get some idea of what he is striving to express, and, if so, we shall be coming to an appreciation of the exquisite fitness of the means by which he has interpreted his thought. Regarded simply as a decorated panel, how charming is the arrangement of forms and spaces! Then what an economy of means! Four planes of delicate wash and a few piquant accents of line and color. Nothing but what is essential, and everything so piquant with suggestion. Popular taste among us demands what it styles a finished picture; but a picture is finished when the artist is satisfied that what he wished to suggest has been expressed.

We shall notice, however, in looking around the gallery, that some of these Japanese artists express themselves with more labored and methodical use of line. They are the ones who correspond, in a general way, to our academical painters; and, while their work represents a notable amount of skilful craftsmanship, we may doubt if it involves the "Kokoromochi" that Gaho talks about.

Since economy of means and an abstract quality of expression are recognized by the Japanese as main virtues, it may strike one as incongruous that, in much of the sculpture exhibited here, there should be so frank and free a use of objective realism. To this a cultivated Japanese will reply that the public like this kind of thing, and, accordingly, it is provided for them; but, while he admires the ingenious skill displayed, for example, in the various groups by Kaneda Kanejiro, he will probably rank as more artistic the broad generalization exhibited in the "Lion and Lioness and the Monkey," by Yamada Chosaburo. They are hammered out of slabs of iron, the actual style of the modeling being admirably adapted both to the method and the material, and to the general character of the animals. These general principles of craftsmanship, it need hardly be stated, run through all the best Japanese art, and are, in a technical sense, one of the chief reasons of its distinction.

Keeping them in mind, and remembering also the Japanese love of exquisite workmanship and of subtle suggestion in their subjects, we should be in a mood to enjoy the objects of lacquer-work, ceramics, and bronze. The visitor is fortunate to be able to examine some of the purest examples of lacquer that the modern artist can produce, for there is a bookshelf, or cabinet, which has been lent by the Emperor. Its surface is of black lacquer, brought to a wonderful richness, upon which are scattered fans painted in gold lacquer by several celebrated lacquer artists, the subject upon each fan having been taken from some famous picture. But even more beautiful are the writing-table and paper and writing-boxes in an adjoining case, for the landscapes in gold and silver lacquer which decorate them are marvels of inventive skill and exquisite handiwork, while the interiors are speckled with gold, and show how nearly the modern artist can attain to the luster and warmth of color of the antique "Nashiji."

Among the ceramics are examples by Miyagawa Kozan, Imperial Court Artist, a notable one being white inside, with a pink flush upon the exterior, decorated with a sprig of the plum-tree, deep-blue in color, with white blossoms, while a line of poetry has been incised right through the paste and filled in with enamel. A gourd-shaped vase, by Kato Tomotaro, has a surface of creamy tone, on which hovers a dreamlike landscape—a piece, in form and decoration, inexpressibly refined. Another fine piece is Manjiro Takito's vase, decorated with carved leaves under celadon glaze; and so, too, is Ito Tozan's pottery vase with wistaria decorations, while the large pair of cloisonné vases by Ando Jubei are splendid in design and in beautiful perfection of color and glaze.

A very choice showing is made in metal objects, illustrating the use of bronze, copper, iron, and that alloy of silver and gold with bronze, called Shibuichi, and the various forms of decoration by means of casting, graving, pierce-work, and inlay. In fact, one of the beautiful lessons of this whole exhibit is the fertility and inventiveness of the artistic imagination, when, as in the case of the Japanese, the pursuit of beauty has been intimately associated with human life and its religious and intellectual ideals.

STRANGE RACES OF MEN

THE INDOOR ANTHROPOLOGY EXHIBIT A RECORD OF THE DEVELOPMENT OF PREHISTORIC MAN—THE OUTDOOR EXHIBIT A RESERVATION OF VILLAGES OF SOME OF THE MOST PECULIAR PEOPLES IN THE WORLD—HAIRY AINU, PATAGONIAN GIANTS, AFRICAN PYGMIES, LIVING AS THEY DO AT HOME—THE REMARKABLE PROGRESS OF THE AMERICAN INDIAN

BY

W J McGEE

THE Anthropology exhibit has the interest of strangeness, for it is an exhibit of races of men whose lives and whose crafts have no counterpart in our lives and crafts. The hairy Ainu, the aborigines of Japan, whose race descent is not yet known; the large Patagonians; the shy Cocopa Indians, of Mexico and Lower California, who have never before left their homes; and the American Indians, of many tribes, from the warlike Sioux to the gentle Pueblo peoples, living here as they do in haunts away from civilization, tell by their customs, their dress, their use of colors, their expressions, and their figures, and not least by their vocations, what many long chapters in human evolution have been.

The indoor exhibit tells how the cave-man wrought with stone hammers and knives; shows the prehistoric means of fire-production, the increase in the use of iron, and the utilization of the wheel; and presents the relics of Egyptian and Central American civilizations, now discoverable only in ruins. Only in relics, too, can the story of the American mound-builders be told. But the outdoor exhibit, beginning at the foot of a sloping hill, where the bearded men and the tattooed women of the Ainu sit outside their thatch-work huts and carve bits of wood into patterns, employing their toes as well as their hands, and ending with the Government Indian school, at the top of the hill, where Sioux and Arapaho and Oneida attend kindergarten, primary, and grammar classes, and build things so fitted to modern needs as farm-wagons—this exhibit tells two living stories. It presents the race narrative of odd peoples who mark time while the world advances, and of savages made, by American methods, into civilized workers.

Let us accept the conventional classification of mankind into five races, which may conveniently be described as (1) white, or Caucasian; (2) yellow, or Mongolian; (3) brown, or Malayan; (4) black, or African; (5) red, or American. This arrangement is not wholly satisfactory, chiefly because it sometimes leaves the classifier in doubt where a particular natural group belongs. For example, the ethnologist hardly knows what to do with the Negritos, of Mindanao; the "Red African," of the Congo; the Maori, of New Zealand; the Ainu, of northern Japan; or even those big-brained marvels of modern humanity, the Japanese themselves.

The whole Fair in its largest aspect is an exploitation of the Caucasian; Mongolians are seen at the Chinese exhibit, and Malays in the Philippine Reservation. The odd peoples like the Ainu and the African pygmies are grouped in the Anthropology exhibit itself; and here, too, are the red Indians, in a range from Patagonia to Alaska.

Another classification of men is based on culture—the term being used in its broadest sense. So classified, men are grouped by what they do rather than by what they merely are. So classified, the tribes and peoples of the globe fall into four or five groups, or culture-stages. The advance of human culture, in its lower stages, is presented in the Anthropology section by classified exhibits, which give a basis for an understanding of what the living exhibits mean. One room begins its display with the earliest of human tools—hammers of naturally shaped stones, and knives that are mere fragments of rock. A visitor traces the gradual evolution of these tools to hammers with handles, to better and better-formed stone knives, to club and spear and arrow weapons. Then groping man discovers fire-making: the crude but ingenious rubbing-

sticks and wooden fire-machines are shown, in which one piece of wood is whirled upon another. Fire leads to the use of metal; the tools become copper and iron. Then round stones are replaced by logs used as rollers, and the rollers to lighter and lighter forms of wheel. Pipes follow the knowledge of fire on the American continent. Ornament and religious symbol appear through all the stages Art expands into images and graven pictures. Clothing takes on dyes, and more and more intricate patterns. Architecture soars from huts to Aztec and Egyptian temples.

The peoples, living in skin tents, dugouts, and thatched huts, outside, picture in their daily life different stages in these lower strata of development. In brief, one may learn in the indoor exhibit how our own prehistoric forbears lived, and then see, outside, people untouched by the march of progress still living in similar crude manner.

Thus, the plans of the Department of Anthropology were laid with reference to the races of the world, the types of human culture, and the desire of all men—whether trained in science or not—to see the previously unseen, to know that which was before unknown.

One of the least-known peoples of the world is the Ainu (the name meaning "men"). Save for a few rather abnormal individuals, they have remained for ages on the Japanese Archipelago; none has hitherto visited the Western Hemisphere. Indeed, they are so shy and so closely restrict themselves to their native haunts that, of all the hundreds of Japanese now in St. Louis, only a single one ever saw an Ainu before he came to the United States. Moreover, they present an ethnologic problem; they are the aborigines of Japan, but are now restricted to portions of the northerly island of Hokkaido, or Yezo. They seem to have no affinity with the modern Japanese, though there may have been ancestral connections. In physical traits, they approach the Caucasian type, though their island home is surrounded by distinct ethnic types. They are as light-skinned as Europeans, and of small, but not pygmy, stature. The males are so abundantly bearded and tressed that they have long been known as "hairy men," while the females have beard emblems tattooed in fixed patterns about their lips.

Already the Ainu group brought to the Exposition by Professor Starr has thrown much light on the character of the people. They live simply, in a reed hut, brought from Hokkaido, and reërected in an out-of-the-way place; yet they are undoubtedly the most polite and studiously courteous folk either within or without the Exposition walls. Their habitation is protected from evil influences by sacred "inao" (prayer symbols) —including a desiccated head of their chief beast-god, the bear. The pagan prayers and ceremonies whereby the habitation was dedicated to the powers of earth, air, water, and sky were most touching. Yet their first formal request after reaching the grounds was for permission to attend high-church Episcopal services.

Before their new house was formally opened, the sacred "new fire" was kindled; and the pagan priest did this in a manner that throws new light on both the origin of the pipe and the conquest of fire; for the pyrite-struck spark was enlivened by the act of smoking through a section of hollow cane. The indrawing of the breath marks an Ainu trait not before noted, though it is in accord with their simple manufacturing processes in which, more strikingly than among any other known people, the tool is drawn inward.

THE PATAGONIANS

Since Magellan's ships circumnavigated the globe, the Tehuelche tribesmen have been known as the giants of Patagonia; and half-mythical notions have clustered about these remote people. Modern observation has, indeed, shown that while the Patagonians are of noble stature and splendid physical development, and rank among the largest of the primitive peoples, they were gigantic only by contrast with Magellan and his men; for, as armor-measurements show, the heroic Europeans of Magellan's time fell far short of the greater statures of modern men. Now the Patagonians form a physical type of mankind rendered exceptionally interesting by reason of the early records and traditions. In a rude way, they form a sort of way-mark, illustrating the physical development of man. At the same time, their cultural characteristics are instructive. The huts in which they live at the Fair are of guanaco skin, and they have some robes of it and of rhea skin that are really beautiful.

THE PYGMIES

In strong contrast with the Patagonian giants are the several groups of little peoples, or normal pygmies, gathered on the grounds. Foremost among these in numbers are several tribal groups in the admirable Philippine exhibit; yet the most typical are the Batwa, of the Congo Valley, representing, as the researches of this department show, the aborigines of Africa. The group brought in by Reverend Samuel Phillips Verner came from the territory of King Ndombe, of the Belgian-Congo Protectorate, by special favor of His Majesty, King Leopold. Like the Ainu, the pygmies present an ethnic problem of the highest interest; and the Exposition affords the readiest means of attacking that problem.

THE COCOPA INDIANS

The Cocopa Indians, of Lower California, were chosen to illustrate a physical, or ethnic, type in which the stature of the two sexes is strikingly different—the males being among the tallest of our aborigines and the females among the shortest of our native women; yet they illustrate also a fairly distinct type of culture. They still cultivate pre-Columbian corn and beans by pre-Columbian methods; they are our finest archers, and perform significant ceremonies of devotional character, attesting the close interrelation between early men and their natural surroundings.

No Cocopa Indians have ever before been induced to leave their homes. They are shy and gentle, and their children are the happiest of all the little "barbarians." They roll about on the ground, play marbles and other games—their brown eyes flashing with interest—and they shoot arrows at a mark with unerring accuracy. One day, Indian games were held. Of four Indians whose arrows struck the bull's-eye, one was a Sioux and three were Cocopa. If a visitor to their encampment set up a coin for a mark, every Cocopa boy turns as quickly as a flash; there is a whizz of arrows, and the coin goes spinning into the air.

The Klaokwaht Indians, of Vancouver Island, too, are living examples of the dominant influence of environment on primitive life; for it is the purpose to bring out the great fact that primitive men are creatures of their surroundings, and that human advance is measured by progress in the subjugation of the materials and powers of the external world.

In like manner, the ethnic types and culture types of the aborigines of the present United States, and especially of the Louisiana Purchase Territory, are illustrated by a Pawnee group occupying a great earth-lodge or residence-temple, constructed in the ancient way; a Wichita group, inhabiting a typical grass lodge; and groups of Arapaho, Sioux, Pima, Maricopa, Pomo, Apache, Chippewa, and several other Indian tribes, each in native domiciles, ranging from the typical tepee to the Navajo hogan, the wattled-wall house of the desert, and the ceremonial long-house of the Northwest coast.

The Indian reservation surrounds the Parade Ground, where the transformed boys and girls of the Government Indian schools perform their evolutions, but it reaches down the hill toward the Ainu and Patagonian villages in a camp of Sioux tepees. It is a typical reservation. There is a typical trading-post there, where the Indians resort to purchase everything they need, from evaporated apples to pens and ink, and where visitors may buy Indian work, from Navajo blankets and Pueblo pottery to wonderful basketry, the best examples of which are works of art, and correspondingly expensive.

Then first comes the village of the Sioux, families from the Rosebud Reservation, in South Dakota, people of magnificent physique and of minds amenable to instruction. The tough and hardy Apache come next, and then the gentle Pueblo folk, busy molding pottery. A Wichita group, dwelling in grass huts, are next to the brilliantly clothed Pawnee braves, endlessly giving a war-dance to the sound of cacophonous drums in the faintly smoky interior of the commodious lodge. The Arapaho dry their beef in the sun within a wattled stockade. The dance-loving Cheyennes come next, and then the Navajo, weaving their gorgeous blankets and cutting ornaments out of silver money. Then there are Maricopa and Pima groups, and the intelligent Chippewa quilt-workers, who match the Sioux for quickness in learning.

Fronting the Parade Ground and the row of Indian villages which surround three sides of it, is the Indian school.

The course of human progress may be traced in a general way from the ethnic and cultural types assembled on the grounds, under the Department of Anthropology, in the Philippine display, and in some of the attractions on The Pike; it may be traced with greater accuracy, although incompletely, by the transformation of our Indian wards through systematic education. Accordingly, a leading feature of the department is a model Indian school, so conducted as to illustrate the educational methods of the United States Indian Office, and also to contrast the craft of trained pupils with that of their parents, both engaged in actual work on opposite sides of the long passage which divides the main floor of the Indian School Building.

Anthropologists have discovered that, in human childhood, whether of race or individual, the hand leads the mind, so that the seat of intelligence is best reached through manual training. This branch of work is explained at the Fair.

The school is under the immediate direction of the Honorable S. M. McCowan, superintendent of the United States Indian Exhibit and director of the permanent Indian school at Chilocco. It embodies the experience of the United States Indian Office, and especially of Indian education; and it is the aim to render it at once a practical illustration of the best way of bearing the white man's burden and a witness to the normal course of human progress—which is from ignorance toward knowledge, and from helplessness toward competence.

The school is a hive of industry and animation. The Indian boys and girls are called at six o'clock in the morning, and at 6:45 A. M. they parade to salute the flag. After breakfast, class-work begins. The little papooses play kindergarten games and do kindergarten work; the older children show their proficiency in the three R's, and, while their elders are sitting on the floor on one side of a long aisle, carrying on their primitive industries, their sons and daughters are exhibiting their skill in civilized handicrafts on the other. Girls, clothed in white, do fine sewing and cook excellent dishes. Uniformed boys and young men make harness, do joining-work, build wagons. A modern dining-room is there, the furniture of which was made at the Haskell School, and, in one exhibit of the Chilocco school, the whole story of Indian transformation is graphically symbolized.

A model of a mountain range has been built up by Indian boys. On the lower slope, near a spring that rises, there is an Indian tepee. Beside it is a rude wattled inclosure, in which grow a few blades of corn. This symbolizes the uneducated Indian. Where the spring flows out upon the plain, at the foot of the mountains, the home of the educated Indian has been constructed. The water from the spring is led into irrigation ditches and a pond. Surrounding a modern frame house and a typical big western barn is field after field of growing crops. The fields are marked off in squares. In one grows corn, in another wheat, in another alfalfa—the actual plants. There is a pasture for cattle and a yard for fowl. The whole is a neatly kept, prosperous farm. This one fresh picture flashes the whole lesson of what it means when, at five o'clock, a wrinkled squaw, passing down the main aisle of the school, peers into the assembly-room and sees her girl reciting to an interested audience or joining her companions in rhythmical calisthenics; or when an aged, blanketed, and feathered brave blinks across the Parade Ground in the evening and sees his son, with head uncovered, standing at attention to salute the American Flag while the Indian band plays "The Star-Spangled Banner." The significance of this exhibit in the Anthropological Section is its showing that a race which cannot of itself make the necessary strides to civilization may be helped; and, moreover, that part of the culture development of a civilized people is the growth of an altruism and a sense of justice that prescribe the giving of such help.

Nor will the exhibit fail to contribute to science. In the basement of the Anthropology Building is an anthropometrical and psychometrical laboratory. During the summer, members of the various races and tribes represented within the Fair will be carefully measured and tested. The data secured will establish the differences and resemblances among the races in length and breadth of head, dimensions of frame, muscular development, perceptions of touch, hearing, smell, taste, and sight, and speed and accuracy of mental reactions. The conclusions obtained are bound to be of interest and importance.

THE AGRICULTURAL CONQUEST OF THE EARTH

A STUPENDOUS EXHIBITION OF THE METHODS AND PRODUCTS OF THE NEW SCIENTIFIC FARMING—THE WHOLE AGRICULTURAL ACTIVITY OF THE UNITED STATES EXPLOITED IN SPECIAL DISPLAYS OF CORN, TOBACCO, COTTON, AND OTHER CROPS, AND IN OPULENT STATE EXHIBITS—STRIKING DECORATIONS IN GRAINS AND GRASSES—NEW MACHINERY—LESSONS IN PURE FOOD—AN UNPRECEDENTED DAIRY DEMONSTRATION

BY

M. G. CUNNIFF

YOU enter the Palace of Agriculture knowing that the United States is the inexhaustible farm of the world, but you have never dreamed of seeing its thousand varied harvests spread out in one stupendous show. Yet here you have them. Down the long vista of the broad main aisles of the twenty-acre building—big enough to contain the whole Pan-American Fair—to left and right are State reservations, high piled with sheaves of grain and heaps of corn, made opulent with milk and honey and butter, cotton-seed oil and cotton, tobacco, sugar-cane, and fruit. There are towers and pagodas and pictures and panoramas in corn-husks, corn-cobs, corn-tassels, and corn-kernels, tobacco-leaves and tobacco-grains, wheat-straw and wheat-heads and wheat-grains; and there are figures in cotton and butter and sugar and prunes and nuts. There are decorations in wavy moss and hemp, in rice-sheaves and prairie grasses. You know at last the wealth of each State, for packed into each of the different sections is an abundant sample of all that springs from one State's soil—whether it be hill-farm potatoes, swamp rice, sea-island cotton, bottom-land corn, prairie wheat, desert dates, or irrigated alfalfa. Nor is this all.

As if overflowing from State confines, the big or significant crops are marshaled down the centre of the building in displays of a comprehensiveness and a magnitude never before conceived of. When you have walked through the tobacco section you have seen in miniature every phase of tobacco production from seed so small that five could rest on the head of a pin, through the fields and warehouses to plug and cigar, and then you stand amazed at the great pagodas and peristyles ornamented and decorated with tobacco. Graceful sheaves of rice surround a rice section, wherein you see real rice-fields in miniature, and every process in rice production, from artesian pumps for irrigation, through the threshing and polishing mills to the marketable grain and its novel products. Corn overflows the whole centre of the building, yellow and white and black and red, its products put to a hundred uses. There are great pillars in the shape of ears of corn; King Corn surmounts a lofty pedestal; corn is used in unheard-of structural and decorative designs. Corn overflows from the sections of the Mississippi Valley States to the central designs; and novel features of the corn story extend to the uttermost corners of the State sections. It is a very riot of corn, which makes one catch one's breath at the thought of the boundless fecundity of American soil. A colossal figure of King Cotton towers over a cotton display which, with the sugar section, tells the story for Southern uplands and river bottoms that corn tells of Illinois and Iowa prairies. No pen could place on paper what the whole outspreading of agricultural treasure suggests to an American. But what the Agricultural Exhibit actually is, he knows—these State harvests, these shows of crops that sweep over the limits of a dozen States, these modern agricultural machines such as no other country uses, these dairy products and dairy processes, these fruits of the soil turned into food and drink, and the outdoor farms, the fragrant Palace of Horticulture, and the scientific Live Stock Barns—this huge suggestion of field and farm and range, granary and mill and storehouse and larder. It is the whole 3,000,000 square

miles of our fertile continent, which feeds the world brought down into visible and comprehensible compass.

In addition, Canada brings into beautiful form the proofs of its fruitfulness, and Germany, France, and England and other countries show their foods and their farming processes. In the dairy display, in a separate section, butter and cheese are wrought into statuary. There is a model dairy at work. A flour-mill is shown in operation—indeed, one may see raw wheat go in at one end of this exhibit, and eat the baked bread that comes out at the other. Literally, for miles you pass the exhibit of food-manufacture—here a kitchen, there a bakery, next a candy factory, again a tea or coffee or chocolate pavilion. You are offered eatables and drinkables for nothing. You are presented with samples—indeed, if one wish, one may leave the building with tea in one pocket, a bottle of molasses in another, and with arms filled with varied articles from miniature cotton bales to packages of breakfast food.

THE PLAN OF THE EXHIBIT

The arrangement of the display is this: As you enter the Palace of Agriculture from the west side, where the huge floral clock makes the hillside conspicuous, the cotton, corn, and other large shows are arranged down the centre aisle, both sides of which are flanked by State exhibits. Along the south side, to the left, are the foreign countries. Along the north side range the food demonstrations, ending with the dairy exhibit. Across the far end of the building is the array of agricultural machinery. Stepping out at the east end, you cross first the most varied garden of cacti ever grown so far north, and then a portion of a rose-garden, which stretches down the long south wall. Then you enter the Palace of Horticulture, with its beautiful display of acres of apples, and with a large conservatory at one end, in which grow orchids, aquatic plants, and rare exotics. Beyond, up the hill, are the Live Stock Barns, whence the milk comes for the Model Dairy. Here are shown the best cattle, horses, sheep, and hogs the agricultural States can send. Along the north wall of the Palace of Agriculture, outside, is an exhibit of windmills, and a beautiful wild-flower garden of two hundred varieties of plants gathered in the woods of Missouri. Some distance from the building to the westward, near the Indian Reservation, is the vast map of the United States, with each State represented by a garden patch of its characteristic crop. And agricultural processes are shown on a farm of seventy acres. Unlike most exhibits, this agricultural show may be seen with comprehension in almost any order—you may start where you will. But you see the big picture and learn the big facts in the Palace of Agriculture itself.

The total impression produced is not that this is the work of farmers who plow and sow and pluck and reap and produce every one his little store. You feel rather that we have come into that era of development when men have discovered the inexhaustible richness of the earth, when they use it as a laboratory, varying and improving its yield at will, and they sow and harvest by such a complete adaptation of machinery that farming has become almost a sedentary occupation; and when science has so been applied to the use of what were once waste-articles that the farmer has become also a manufacturer of a great variety of products. For, in the first place, the American farmer is keen and progressive. In the next place, he belongs to a farmers' institute, which disseminates helpful information, and stirs up enthusiastic competition among its members in scientific farming. He sends his son to the State agricultural school, and the boy returns full of new ideas, and proud to be a farmer. His State Experiment Station is constantly learning new facts about his soil and his crops, and telling him. The national Department of Agriculture, with a bureau of soils, a bureau of entomology, a bureau of plant industry, a bureau of animal industry, and a bureau of irrigation, gives him opportunities that mean to him both education and wealth. The marvels these bodies have performed, and are now performing, are shown at the Fair.

ALL THE FACTS ABOUT TOBACCO

Tobacco comes first. A mammoth leaf made of tobacco leaves greets you at the entrance of the Palace of Agriculture. Here is a miniature tobacco-field: the brilliant green hotbed of seedlings, the transplanted tobacco in rows, the negroes "topping" the older plants and cutting the fully ripe ones. Then there are the drying-sheds, with the yellow

and brown leaves hung up to cure. Then the warehouse, where the dried leaves are pressed down into hogsheads, to be sold on the Louisville market. Then study the specimens: this kind goes to Italy, this to West Africa, that to England. Users of tobacco are most particular—a Hottentot must have a twist from one Kentucky farm, while a Russian peasant demands a plug of a slightly different flavor from the other end of the same Kentucky county. Nor is all tobacco used for human solace. Here are nicotine and tobacco oil for insecticides and sheep dip, and the ash of tobacco-stems for fertilizer. Nor all for pipes and quids. Step into the State sections. North Carolina and Virginia are growing light tobacco for cigarettes. Connecticut began to grow Sumatra leaf for cigar-wrappers under canvas-topped acres; now Wisconsin, Pennsylvania, the Southern States, and even Massachusetts, are doing the same. Genuine perique comes only from a small section in Louisiana—deep black, jammed and pounded into "carrots" of the consistency of hard pine wood. One grower boasts that his farm supplied tobacco to four popes. And no smoker need deny, till he tries their pungent aroma, that cigars made of perique, mixed with a little American-grown Havana, are excellent. Nor need he question the Havana. A red soil, found in North Carolina and in Texas by the Government Bureau of Soils, produces a tobacco, shown at the Fair, which cannot be distinguished from the Cuban-grown leaf. But do not visit the Egyptian section to see the raw material of Egyptian cigarettes. Commissioner Abaza will tell you there that the Egyptian Government, by law, forbids any Egyptian farmer to raise tobacco: the duty on tobacco imported from Turkey, to be made into Cairo cigarettes, is too remunerative.

He will then show you the nubbins that are called corn in Egypt, point expressively to the corn show that flaunts its huge yellow ears before him, and declare that he is going back to Egypt, after an extended study of the Missouri and Illinois farms from which this corn came, to teach the Egyptians how to change their nubbins into American corn. For the Fair has taught him, as it has taught many others, that corn is plastic—almost anything can be done with it. It can be coddled and molded and guided as it grows, and its products take many forms.

THE MARVELS OF CORN

Illinois, Iowa, and Missouri have concentrated intelligent effort on corn as Pittsburg has concentrated on steel. Follow the gorgeous corn-show of the main aisle into the corn-shows of the States. A jar of oil shows the oil product and a jar of protein the protein product of a bushel of corn from a specimen Missouri farm in 1896. That year, the experimenters started to breed corn—some of it for oil, for the brewers would pay three cents a bushel more for corn higher than the average in oil; some for protein, for the stock-breeders would pay more for corn full of protein. A series of jars tell the story of the years that follow. In 1896, the crop averaged 4.7 per cent of oil. In 1903, the crop bred for high oil had 6.53 per cent.; the crop bred for low oil had 2.97 per cent. In 1896, the protein average was 10.92 per cent. In 1903, the corn bred for high protein had 13.04 per cent.; the crop bred for low protein had 8.62 per cent. Nor are such things done only at the State Experiment Station, which furnishes this object lesson. The farmers themselves have learned how to breed their corn.

No longer will they take any kind of seed-corn for planting. From the best rows, the best plants, the best ears of one year, they take their seed for the next year. If they want oil, they plant seed from ears rich in oil; if protein, from ears rich in protein, as shown by tests of sample grains from it. Thus, they plant for long ears, for short ears, for kernels set close together on the cob, for kernels set in straight and regular rows, for fat and full kernels, or for the minimum of kernel and the maximum of cob. In the Missouri Section, for example, are the most stupendously fat ears you ever saw—grown for corn-cob pipes, of which one little Missouri town turns out a million a year. You may see a photograph of two rows of corn growing side by side, one planted from random seed, one planted from selected seed. Below are baskets filled with the ears from these rows; those from the random seed are small, gnarled, imperfectly developed; those from the selected seed large, regular, evenly plumped. The exhibited heaps of corn about you show which form of planting has been followed by the corn-growers; for their essential effort is for better and better corn of a standard kind.

Blind choice accounted for some of the development of American corn. You may see, in the Government Building, ears of the kind of corn grown here before Columbus came—small ears, of a single row of grain, hardly bigger than wheat-heads. The corn we know grew from that. But the new corn, the ideal corn, has developed through the application of initiative and brains. Five years ago Professor A. D. Shamel was at the Illinois Experiment Station. So was Professor P. G. Holden, who there began the work he was still doing in June, when he took a flying trip through Iowa on a special train, preaching the gospel of good corn from the rear platform at stations. These men tried to arouse the farmers of Illinois to improve their corn.

W. B. Otwell was then president of the Farmers' Institute of Macoopen County. The thought struck him that if the farmer boys throughout his county could be induced to take an interest in the effort, Macoopen County would produce the finest corn in the world. He persuaded the institute to offer a prize for the best ten ears of corn grown by Macoopen County farmer boys. Each boy made application to him and received a package of selected seed—Yellow Dent and Boone County White. Hundreds applied.

In the fall, the boys sent in their corn. The prize—a bicycle—was awarded. Mr. Otwell went down to see the boy who won—expecting to find him the son of a prosperous farmer. The boy proved to be the fourteen-year-old son of a poor widow inhabiting a little prairie cabin. All summer the boy had "toted" water from the well to his corn-patch in bucketfuls. His industry had been remarkable. He was invited to the next meeting of the Farmers' Institute. Mr. Otwell lifted him upon a table. "This," said he, turning to the assembled farmers, as he pointed to the little barefoot youngster in his blue-jean overalls, "is the boy who won the prize." The cheers that greeted the boy were louder than those which later on greeted the Governor of the State, when he came down to make a speech.

For, when these contests had continued several years, the Governor became interested. Mr. Otwell had conceived the idea of extending the contest to the boys of the State, and showing at St. Louis the corn they produced. The Governor subscribed. So did other citizens. One offered a $1,000 Holstein cow for first prize. Other prizes were offered—wagons and plows and windmills. Seventeen thousand boys wrote for seed and information. Two farm-wagons would not contain all the letters. The State went into wild enthusiasm—over corn.

And now return to the World's Fair Palace of Agriculture. In the Illinois Section is a mountain of huge, yellow ears of corn, row upon row, tier upon tier, of little symmetrical pyramids of ten ears each. Before each pyramid is the photograph of the Illinois farmer boy whose corn it is. The selected output of 8,000 Illinois boys is represented. Can you imagine what this means? Eight thousand boys aroused to a pitch of enthusiasm for scientific farming. Seed-corn enough to plant the whole Illinois corn belt. If a bountiful crop sprang from the fertile soil last year, a more bountiful crop will leap forth next year.

Step over into Iowa. The silver cups and other trophies there are not the prizes of golf games or athletic triumphs. This gold ear of corn, with the silver husks, was won by one corn club; that cup by another. Four neighboring Iowa farmers form a corn club. From the corn their acres yield are picked six ears. At the seat of the farmers' institute, the specimens of the county's corn clubs are judged, and four hard-working farmers bear off the prize. A new kind of Olympic game!

Range around the Indiana and the Missouri Sections; view the scenes of farm life pictured in ingenious mosaics of corn-kernels, corn-silk, corn-husks, and corn-stalks; see the enormous portières made of ears strung on cords, the tassels and pendants, the pergolas and the towers—all brilliant in varicolored grains. The practical lessons are set forth below. There is nothing known about the culture of corn that one may not learn there. You discover the nutritive value of various kinds of corn, for you see corn dissected and analyzed, reduced to its constituents. You learn the varieties best suited to particular soils, and you are made aware how corn can be acclimatized, how good corn may be gradually spread west or north or south. The first year in the new region the yield falls off, but if the distance from the original corn-field has not been too great the second year's yield will reach—in Iowa, for example—the original Illinois product per acre. All corn

facts are somewhere set forth and explained. And all the products of the corn plant are there—oils, paper, pith (that is used in battleships to stop shot-holes below the water-line), whisky. There are three kinds of sugar and two each of syrup and molasses. There are many food elements—different kinds of cellulose, vicose, pyroxylene, and amyloid. There are many products useful in the arts: celluloid, collodion, sizing, varnishes, films, filaments for incandescent lights, artificial silk, guncotton, smokeless powder, and fine charcoal. There are many varieties of starch and of glucose, several kinds of gum, grape-sugar, corn-rubber (used for buffers on railway cars), corn-oilcake and meal, malt, beer, wines, alcohol, and fusel-oil. One may see also shuck-mats and shuck-mattresses. How many products of corn there are nobody knows, for new products are evolved every year. And in the fascinating and scientific game of seeing what may be done with corn, the lessons one State learns are freely given to the other States and to the world. The Fair shows Egypt how corn should be grown; a South African has offered $100 for the ten prize ears in the Illinois Farmer-boys' Section, to form the basis of an improved South African crop; and yet, with all the corn triumphs displayed at the Fair, the corn-growers and the manufacturers of corn products are as keen as ever to better their results.

COTTON IN A HUNDRED FORMS

Mississippi's King Cotton, looming tall in the centre of the Cotton Section, vies with Indiana's King Corn in challenging attention. At his feet are two life-sized figures of negro cotton-pickers, with half-filled baskets. As with tobacco, you may follow the production of cotton from the planted seed through field and gin and mill to the many usable products —ranging from cloth to doughnuts fried in cotton-seed oil. Ask what question you will about cotton—it is answered in object-lesson.

Here is a Louisiana cotton with a staple—or fibre—as long as the famous sea-island cotton. But it clings closely to the seed. Well, here is a new kind of cotton-gin which takes it off more neatly than the old kind of gin. Some lint must stick to any seed. True, but here is an ingenious Louisiana man who gives the seed a chemical bath, which leaves it unharmed but saves the lint—a hundred pounds from an acre. He bales it with cord that he makes from the bark of the cotton-shrub. Space in freight-cars and on shipboard is valuable; watch how a machine absorbs the cotton fed to it and presses it into a cylindrical bale one-fourth as large as the bunchy, rectangular bale it came in, and as hard as a board.

Once the cotton-seed and the stalks were thrown away. But now you see, at the Fair, paper made from cotton-stalks. You see, in the Virginia Section, a brilliantly lighted fountain, which strangely fails to splash. A closer view shows the seeming water to be cotton-seed oil. Tall jars, surrounding the fountain, are filled with different soaps manufactured from such oil. Not far away is a demonstration of the value of the oil as food. The cake made when the oil is pressed out is fed to cattle—it has valuable properties as a flesh-former. Nor is there any fertilizer richer in nitrogen.

The Southern planters have begun to imitate the corn-growers in planting selected seed to improve their crops—the long-staple cotton of Louisiana shows what can be done. But there has been no agricultural advance made in recent years more notable than the utilization of the cotton-stalk and the manifold transformations of the formerly despised cotton-seed. Just after the war it was a common practice to move a ginnery when the discarded cotton-seed had so piled up about it as to be uncomfortably in the way. Now, not only in Georgia, but in Mississippi and the other Southern States, there is a cotton-seed-oil mill at every cross-roads.

NOVEL FACTS ABOUT RICE AND SUGAR

The rice exhibit presents the novelty of growing rice-plants surrounded by models of all the machinery and the mill equipment for handling the grain; and it is beautifully, though simply, adorned with rice-sheaves.

"Providence" rice has long been grown in the Southern States, but up to within a few years most of the rice we consumed had been imported—largely from Honduras. Now we raise 20,000,000 bushels a year, some of which is exported. Fifteen years ago, two Iowa farmers, named Duson, came to Louisiana for their health. They brought their farming instinct with them. Why not irrigate Louisiana rice by artesian wells, grow

it on a large scale, and reap it with wheat binders and threshers? They tried it. It proved a success beyond their anticipations. Other farmers came down from Illinois, Indiana, and Iowa. The Louisiana sugar- and cotton-planters turned to rice. Land worth 25 cents an acre rose in value to $125 an acre. Government investigators went abroad in quest of a rice that would not break in milling as much as the long Honduras grains. They returned with a round, hard rice, of which but 6 or 8 per cent. is broken in milling, to 25 per cent. of the other.

Louisiana—and Texas—planted this. In twelve years there has been no crop failure. No troublesome insect has yet appeared. The artesian water used has properties that make it exceptionally good for irrigation. A new agricultural product has reached importance under most auspicious circumstances. Its increase depends largely on the realization by the American people of such facts as are emphasized by the rice-cooking demonstration at the Fair, where 250 ways of cooking rice are exploited—for rice is one of the best of foods.

Before seeing this, however, it is decidedly worth while to examine the processes through which rice goes—fourteen operations in a single mill. And the rice products are as diverse as the products of corn are diverse—nothing is wasted.

The sugar exhibit is a similar story of production from cane through mill to varying grades of sugar, molasses, and syrup, to excellent paper made from sugar-cane, to fodder and fertilizer made of refuse that once was thrown away. A new device in the process of securing the juice from the cane is an automatic sampler, so arranged that, as the juice flows along in a stream, a little is let out from time to time as a specimen from the run. A life-size sugar figure of a woman is a feature of the sugar display.

SOME STATE DISPLAYS

But amazing as the five great central exhibits are, they by no means shadow the marvels in the State displays, for the facts about wheat, and oats, and potatoes, and alfalfa are even more important than the facts about sugar. They are as carefully and scientifically cultivated and improved as corn. Macaroni-wheat has, in large measure, supplanted the softer wheats, and Kansas and Nebraska have thus been able to push their wheat belt farther westward. The Burbank potatoes shown by California are a foot long and of excellent quality—one is a meal for a family. Colorado shows oats eight feet tall. Oregon has cuttings of five crops of a single planting of alfalfa—measuring ten feet of growth for the season. Utah is improving wheat by planting the seed of irrigated grain in rain-watered land, where it soon becomes acclimated. And, as you pass from State to State, you become acquainted with the great farmers of the country, the masters of agriculture, such as David Rankin, of Missouri; J. L. Overstreet, of Indiana; the Shunk brothers, of Illinois; and ex-Governor Hoard, of Wisconsin. Here are the results in which they take pride. Nor will you lack interesting spectacles—the panorama of the Utah Valley, for example; or Nebraska's biograph, which makes you live half an hour in Nebraska.

THE MODEL DAIRY AT WORK

The Exposition has 100 cows in its herd. Of course, they are scientifically fed. To begin with, they are scientifically selected. A record is kept of every cow's food and milk. The milk is brought to the model dairy in the Palace of Agriculture, and what happens to it then you may see through the large plate-glass, of which one side of the dairy is constructed. It is scientifically tested, so that the value of every cow and of every cow's food may be known. Then it is separated, the cream and the milk each going one step further in the interesting processes that follow. Finally, at the end of the long, glass wall, you may buy a glass of milk, or of buttermilk, or a plate of ice-cream, or a piece of cheese, whose whole history, from the food that the cow (of a certain pedigree) ate, has been recorded by the most accurate tests. You may see every stage of the process.

All about you, too, are the exhibits of the makers of dairy machinery and apparatus, who will take your orders for things wherewith you may make your own stable and dairy as clean as your living-rooms, and as safe from bad germs as any other laboratory. And of sculpture in butter there is no end.

The meaning of the attention paid to dairy methods might be summed up in a few facts exploited in the exhibit of Wisconsin,

the State which is linked with the fame of Professor Babcock's work. The Babcock milk-test saves the farmers of Wisconsin alone $800,000 a year, and, if the farmers of the country adopted the scientific milking methods proved efficacious in Wisconsin, they would obtain $100,000,000 a year more than they do for their dairy products. And here is the specific story of what one test accomplished:

To a certain Swiss-cheese factory in Wisconsin—for the State produces all kinds of cheese—a number of farmers were in the habit of bringing every day enough milk to produce 600 pounds of cheese, which was supposed to be of the highest grade. Suddenly, the grade of the output fell off to No. 2, which sold at three cents a pound less, resulting in a loss of $18 a day to the eleven farmers supplying the factory. The curd test was applied. It was found that the defective milk came from one of the eleven herds. A test of the milk of all the cows in that herd proved that the bad milk came from a single cow, which was suffering from a disease of one hoof. The cow was removed from the herd—and the factory resumed producing No. 1 cheese. The cost of the test was $9. It stopped a loss of $18 a day.

OTHER EXHIBITS

In the area given to agricultural machinery, the layman will see a plow said to have been used by Daniel Webster, when he was a boy, and, near by it, a steam plow that would have amazed Daniel Webster more than any event that happened in his lifetime. The expert will find—whatever he wishes to see, whether it be a thresher with a capacity of 5,000 bushels of wheat a day or the latest improvement in corn- and cotton-planters. Many machines are in motion, so that their structure and peculiar advantages may be the better understood.

THE HORTICULTURAL SHOW

The exhibit of apples and other fruits, in the Palace of Horticulture, is an unprecedented achievement, conveying practical lessons. No State was permitted to exhibit unless it could show last fall that it had enough fruit in suitable cold-storage to keep its display supplied throughout the Exposition, for the apples must be changed from time to time. This meant holding a portion of last year's crop fresh and crisp until next winter. There never was before seen such a display of apples in the spring; and the results of cold-storage on different kinds of apples, and on apples grown in different soils, give new and useful scientific information.

PURE FOOD

The definitely educational and scientific value of the Exposition is illustrated by the large section of the Palace of Agriculture given to a display of pure foods, and by the discussions (in September) of pure-food laws and problems. There is a laboratory where preparations of food are analyzed. One may see there pieces of cloth (originally white) which were soaked in prepared food products and indelibly dyed by the harmful coloring matter used to color or to preserve the food. The preparers of pure food make demonstrations of their methods, and give proof of the harmlessness of the materials that they use. There are held, during the Fair, a series of meetings—food congresses, meetings of food chemists, etc., and practical lessons in cooking various things are given during the whole period of the Exposition. A Pure Food Commission, made up of State, Dairy and Food officials, is making an especial effort to bring the adulteration of food, and especially the use of harmful substances, into intelligent publicity and under the condemnation of good pure-food laws. The crimes and the deaths that impure food preparations have to answer for are enough to make civilization blush. Yet the task of forcing all manufacturers to use honest labels and to discontinue the use of hurtful substances is an appalling one. Almost every State has a different law. Some States that have good laws cannot rigidly enforce them. The whole subject is in a chaotic condition. An effort will be made by the scientific work done in the Palace of Agriculture, and by the work of the Pure Food Commission and by the congresses and discussions, to arouse public sentiment, to cause the enactment of good laws and their enforcement—in a word, to wake up intelligent public opinion.

For instruction in the preparation of special kinds of food—food for the weak, for the dyspeptic, for the fat, for the lean, food for babies, food for old persons—the practical scientific knowledge that is put within reach

of the visitor seems exhaustive. You may find out the truth about any kind of food, for any purpose; you may learn how to prepare it; you may see it prepared; you may taste it; you may carry away with you volumes of food literature. Most expositions hitherto have contented themselves with exhibits made by private food-manufacturers and venders. These are here, too, in great numbers. But, in addition to this advertising display, you will find scientific work conducted under the direction of the Exposition and of trustworthy commissions. There ought to come a new era in the understanding of food values and in the popular knowledge of the preparation of food, as a result of all this work. Indeed, the whole agricultural exhibit is stamped with practicality.

MODERN MINING AND ITS PRODUCTS

THE MOST COMPREHENSIVE DISPLAY OF MINERAL WEALTH EVER MADE —MINING METHODS SHOWN IN ALL THEIR AUTOMATIC EFFICIENCY

A COLOSSAL coal-black statue of Vulcan looms fifty feet high in the Palace of Mines, thrusting with upraised right arm a spear-head among the very rafters. It typifies the meaning of iron and the magnitude of the Alabama iron industry. Spread before it are heaps on heaps of minerals—massive pillars of coal, polished granite blocks, exhibits of every ore known to man, in which State vies with State, and country with country, for richness and variety of product. There are common building-stones, gold-nuggets, precious gems. Around and between and among the displays is activity—stamp-mills crushing ore, coal-mines in operation, coal-breakers automatically crushing, sorting and conveying coal, concentrating-tables separating metals from the mother-rock—some of full size, others working-models.

Outside the building is the Mining Gulch, where the mining-camps, the ore-mills, and even a foundry, are real. Here, too, are an artificially made turquoise mine and a crystal cave, conveying an actual impression of underground wonders in New Mexico and North Dakota. One may ride through an imitation coal-mine and see lay figures of miners repeating the phases of industrial life in the Pennsylvania anthracite fields; though this, like some of these other Gulch features, is a private enterprise, to which an admission fee is charged.

More and more the mining and handling or ore is carried on by automatic machinery. So not only in the working models and in the mines and mills in the Gulch, but also in separate exhibits, machines are displayed which minimize human labor. A survey of the indoor exhibits and a trip through the Gulch give in very brief time a comprehensive knowledge of the needs, economies, and results of modern mining.

Not an item has been omitted, and special departments of mining have been exploited as never before. Many foreign countries have exhibits, but the most immediately striking displays are made by the States. Even Iowa, which everybody thinks of as a prairie State, comes forward with products from its 300 coal-mines, and alluvial Nebraska makes an interesting exhibit, the basis of which is a joke. Nebraska shows the soils in which are grown its corn crops. Above some of the tall glass jars of prairie earth are two glass vessels filled with gilded and silvered ears of corn. The legend reads, "Gold and silver nuggets extracted from the agricultural soil of Nebraska to the amount of $200,000,000 a year. It is the surest of all mining, and the wealth is distributed among a greater number of people."

But, in the sections where the mining States spread their riches of mineral and metal, the United States is shown in object-lessons to be a veritable treasury.

Colorado has a display that is probably the most beautiful and symmetrical array of precious minerals ever exhibited. Gold is heaped up in the centre in a yellow pile. Its neighbor is a white heap of silver. Another broad, yellow patch strikes the eye; it is

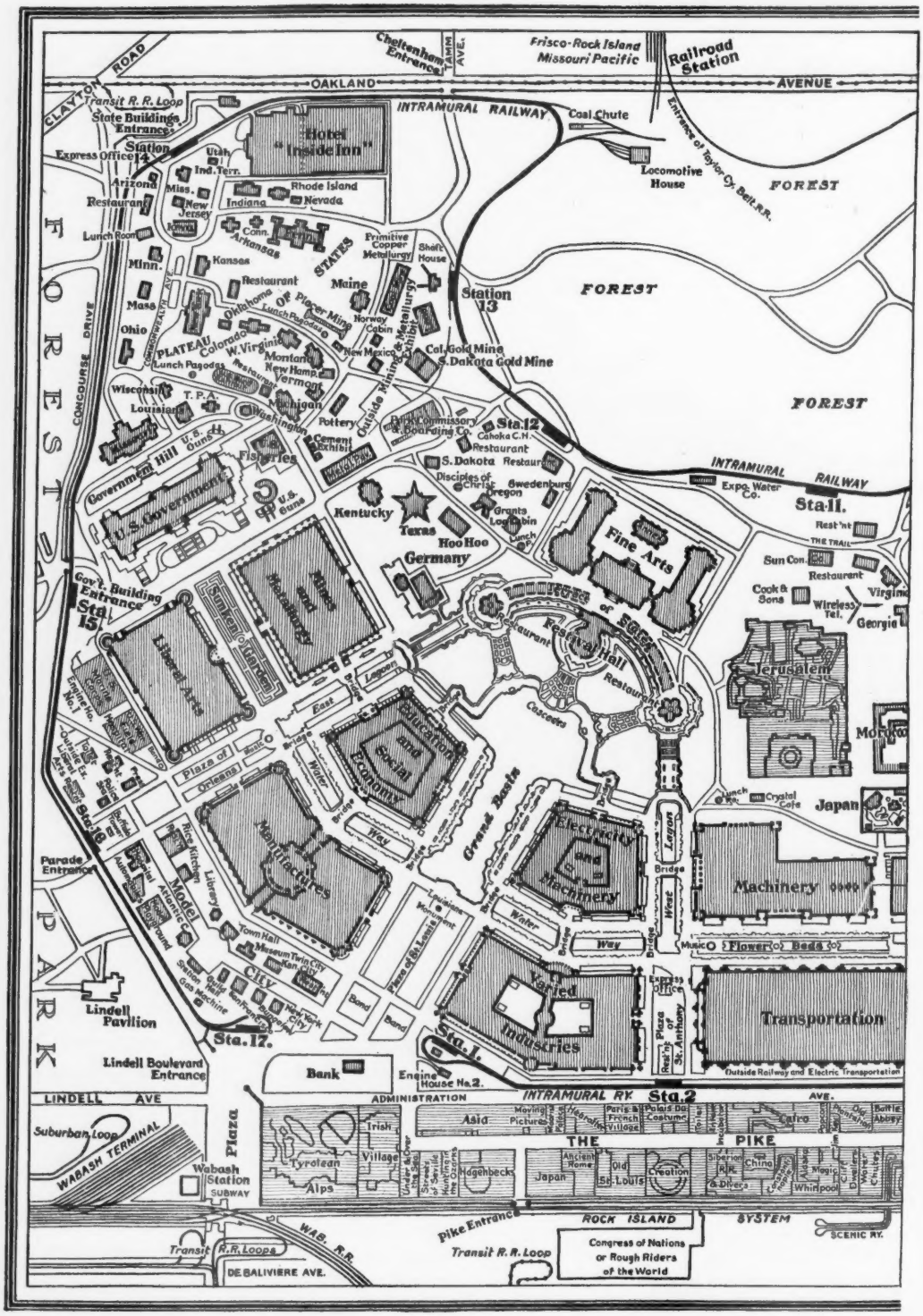
carnotite, from which radium is extracted. There are slabs of ore from the famous Portland Mine, at Cripple Creek, with free gold sticking out all over it. There is a heap of copper in its various stages, and a brilliant collection of multicolored gems. Louisiana shows a figure of Lot's wife in salt, and Utah, too, exploits salt in exhibits that range from vivid photographs of salt harvesting along Great Salt Lake to jars of brine from the lake itself. Salty? Five barrels of this lake water contain one barrel of salt. California presents many large gold nuggets and models of the largest nuggets ever found in the United States. Montana tells the story of copper, and Pennsylvania the story of coal. Nevada and Arizona give exhibitions of borax in its many uses. State after State expends its mineral resources in decorative structures—here a coal arch, set up by Indiana; there a coal tower, presented by Pennsylvania; here a pyramid of a beautiful pink California mineral, from which lithia is made; there a tower of copper bars from Montana.

Private firms have separate exhibits of mining machinery of marvelous efficiency; there are enough automatic machines in view—coal-cutters, rock-drills, hoists, conveyors, and mill apparatus—to show that the man with the pick is no longer the symbol of mining. The symbol is rather the man with his finger on the trigger of a compressed-air tool, or on the lever of a steam-engine, or on an electric switch. Human interest is not lacking even in these exhibits of machines. As you wonder at an automatic drill thunderously eating its way into granite at the rate of half an inch a minute, you are told the tale of machine contests in Colorado. The men who race must put together a machine, set it up, drill three holes in different directions into a slab of rock, and then take the machines apart again. The game is played amid intense excitement.

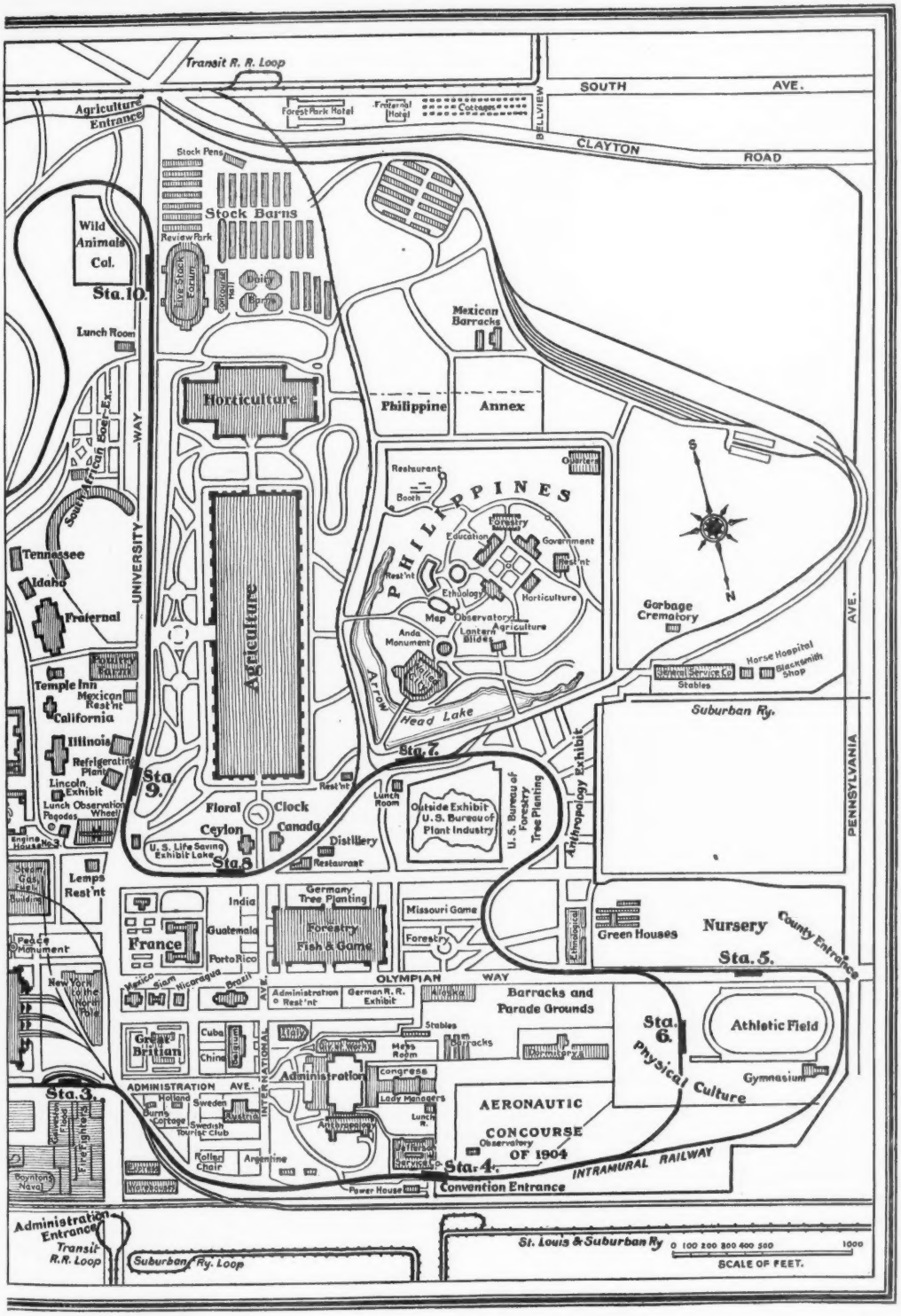
But the models that show the underground arrangements of mines, the working models which reproduce in miniature every detail of mining and handling minerals, and the full-sized mills in the Gulch are the most interesting and informing exhibits. Men are able, by boring out cores of rocks in selected places over a stretch of country, to make as accurate a reproduction of what is underground as a maker of relief-maps can make of the surface. Mine owners, of course, know the ramifications of their shafts and tunnels. So here at the Fair are models, in glass and in actual mineral material, of whole sections of the underearth. The glass ones are so arranged that an observer can look among the imitated rock strata and among the tinted veins of the earth as he might look into the transparent interior of an aquarium. The working models give him the feeling a giant might have if he could look down on the coal-mining tipples of Pennsylvania, or remove the top layer of the earth in Colorado and see the midget men at work in the tunnels, or gaze down into the open iron-mines of Michigan. In brief, you may stroll about and see Liliputian mining and ore-working of every form going on about you; whole industries brought within the scope of a glance. It you have ever spent a day in a gold-mine or a coal-mine, take this as a hint of what you may see in the Palace of Mines—there are models here that, in five minutes, give you a clearer idea of mining operations than your whole day gave you underground.

In the Missouri Section are a coal-tipple, a lead and zinc concentrating mill, and a magnetic separator for lead and zinc ores. There are several stamp-mills. South Dakota's is of full size. In this mill, ores from every part of the country are treated, to show the relative values of different processes for extracting metal from ore.

Other interesting exhibits are here without number. There are jewels spread out, of every hue and brilliancy. The largest exhibit of radium ever gathered gives a layman as clear an idea as he wishes to have of this strangest of elements; for in a small, dark room its properties are shown in experiments. The Standard Oil Company makes a display of oil and its many products. Another company shows the manifold products that come from coal. A Pittsburg steel company has sunk a broad section below the level of the floor, within which it exhibits armor plate, all splashed with shot-holes, and the latest forms of automatic quick-firing guns, range-finders, and other military and naval equipment. Towering above the exhibit is a model of a full-sized battle-ship turret, with two huge thirteen-inch guns projecting. And the foreign countries, notably Japan, Germany, and Canada, teach an American much about mineral resources and mining methods abroad.


Cheltenham Entrance
Frisco-Rock Island Missouri Pacific
Railroad Station
OAKLAND AVENUE
CLAYTON ROAD
Transit R. R. Loop
State Buildings Entrance
INTRAMURAL RAILWAY
Coal Chute
Hotel "Inside Inn"
Express Office
Station 14
Locomotive House
Entrance of Taylor Cy. Belt R.R.
FOREST
Arizona
Miss.
New Jersey
Rhode Island
Indiana
Nevada
Utah
Ind. Terr.
Restaurant
Lunch Room
Conn.
Arkansas
STATES
Primitive Copper Metallurgy
Shaft House
Minn.
Kansas
Restaurant
Maine
Station 13
Mass.
Oklahoma
Of Placer Mining
Norway Cabin
Ohio
PLATEAU
Colorado
W. Virginia
New Mexico
Col. Gold Mine
S. Dakota Gold Mine
Montana
New Hamp.
Vermont
Lunch Pagodas
Restaurant
Wisconsin
T. P. A.
Louisiana
Michigan
Washington
Pottery
Outside Mining & Metallurgy Exhibit
Park Commissary & Touring Co.
Sta. 12
Cahoka C.H.
Restaurant
Cement Exhibit
Government Hill
U. S. Gunboats
Fisheries
S. Dakota Restaurant
Disciples of Christ
Swedenburg
Oregon
Grants Log Cabin
Lunch
INTRAMURAL RAILWAY
Expo. Water Co.
Sta. 11.
Rest'nt
THE TRAIL
Sun Con.
Restaurant
Cook & Sons
Wireless Tel.
Virginia
Georgia
U. S. Government
Kentucky
Texas
Hoo Hoo
Germany
Fine Arts
Gov't. Building Entrance
Sta. 15
Mines and Metallurgy
Sunken Garden
Liberal Arts
Palaces of Science
Central Hall
Restaurant
Jerusalem
Morocco
Lagoon
East
Cascades
Education and Social Economy
Plaza of Orleans
Grand Basin
Electricity and Machinery
Japan
Crystal Cafe
Lunch
Manufactures
Rice Kitchen
Model
Machinery
Parade Entrance
Library
Town Hall
Museum
Music
Flower Beds
Lindell Pavilion
Sta. 12.
Varied Industries
Transportation
Outside Railway and Electric Transportation
Lindell Boulevard Entrance
Bank
Engine House No. 2.
Sta. 2
Sta. 1.
LINDELL AVE
ADMINISTRATION
INTRAMURAL RY
AVE.
Suburban Loop
WABASH TERMINAL
Plaza
Asia
Moving Pictures
Paris & French Village
Polar's Dip
Costumes
Cairo
Bottle Abbey
THE PIKE
Irish
Tyrolean Alps
Village
Hagenbeck
Ancient Rome
Old St. Louis
Creation
Japan
Siberian Mine & Diver
China
Whirlpool
Wabash Station
SUBWAY
Pike Entrance
ROCK ISLAND SYSTEM
SCENIC RY.
Transit R.R. Loops
WAB. R.R.
DE BALIVIERE AVE.
Transit R.R. Loop
Congress of Nations or Rough Riders of the World
FOREST PARK
CONCOURSE DRIVE

A PLAN OF



THE FAIR GROUNDS

WHAT THE GOVERNMENT DOES FOR THE PEOPLE

AN ENTERTAINING AND SIGNIFICANT EXHIBITION, WHICH SHOWS OUR MANIFOLD NATIONAL ACTIVITIES AND AROUSES THE PATRIOTIC INTEREST OF THE PEOPLE

NINE people out of ten at the Fair, when asked what exhibit interests them most, will say "The Government's." Watch a party of visitors from a Mississippi Valley State, people who have never seen the sea, as they wander through the passages of the battle-ship model or squint along a rapid-fire gun on deck, across an imaginary ocean. The shine in their eyes betrays a mixture of excited interest and patriotic pride. Far though the coast may be from their homes, it is yet their coast that such battle-ships guard, and the battle-ships are theirs. And it is a semi-proprietary satisfaction that affords a good part of the pleasure that any American evinces in gazing at the processes or results of the many government activities he sees exploited here. A visitor will observe a hundred interesting novelties; he will leave the building—only to go back later for another look—round-eyed with amazement at the many things the government does for the people; but his spirit will be self-gratulatory—it is *we* who are doing it all.

And, indeed, it is much. You may enter the spacious and dignified building from the south; you walk into the State Department, where you can look back through a glorious history with the aid of priceless documents and national relics, or forward with the aid of a relief-map of the new Panama Canal, or of a map that shows the route of the proposed intercontinental railroad to South America. Enter from the west, and you walk either into the mint or into the United States Army exhibit. From the north, you come into the Post-Office or the Geological Survey. An east entrance offers a choice of the Navy or the National Museum. Start anywhere, and zig-zag up one side of the building and down the other: you have visited every department and bureau of the government. You have seen how mines explode under battle-ships, how coins are made, how rain is measured, how radium is used, what the Yosemite Valley looks like, what kind of Esquimau dogs draw the mail in Alaska, how bugs lay their eggs in pools, how mosquitoes breed and silkworms eat, how snag-boats pull stumps from the Mississippi River, how battle-ship bulkheads are closed, how trichinæ are discovered in pork, how drugs are tested, how color-printing is done, or you may have been interested in sun-spots, apples, giraffes, Krag-Jorgensen rifles, or cheese.

Whatever the inadequacies of the United States Post-Office, indubitably it serves more people than any other institution in the world, in divers ways, very intimately, and often romantically. Yet, in comparatively small space at the Fair, all its activities are carried on, suggested, or pictured. Here is an actual post-office very busily handling the mail of the Fair—you can see every operation. Here an automatic canceling machine is stamping a flying white ribbon of letters. Crowds of visitors are peering into mutoscopes, wherein they see postmen, in city and country, delivering and gathering letters, mail-trains snatching and discharging sacks while running sixty miles an hour, marine transfers from ocean liner to mail-boat or from mail-boat to lake steamer, and other picturesque handlings of mail. In one corner is a pneumatic tube in operation. Models showing different kinds of mail transportation range from Porto Rico mule-back service to star-route pony-riders, from rural delivery-wagons to an Alaskan dog-sled with its team, from trolley-cars to a full-sized railway mail-car, in which clerks are at work. A musty old book records all the dead letters from 1777 to 1788—365. For the corresponding eleven years a century later there were 2,660,324. And here are specimens of some modern dead letters—coffee-pots, skulls, fire-crackers, dolls, revolvers, bottles of whisky, bombs: a museum of curiosities. And whatever phase of postal

effort can be most vividly presented by a picture is set forth in a series of paintings. Whoever has ever written a letter to any destination can see here what is done with it from the time it starts to the time it arrives.

The Smithsonian Institution and the National Museum show an array of wonders. There is a Children's Room, full of rare birds and fishes. Beyond is an astrophysical laboratory. A bolometer is shown, which measures heat to one-millionth of a degree, and a galvanometer, which measures one-billionth of an ampere of electricity. There are also transparent photographic plates, lighted from behind, which realistically illustrate the phenomena of eclipses and of eruptions on the sun. Outside are collected many of the wonders from the National Museum, reproductions of extinct animals, a skeleton of a whale, stuffed birds, and animals, fishes, and reptiles, Indian baskets, models of Aztec temples, minerals, and fossils. This exhibit entertains far better than most museums, for it is a selection of the most interesting of museum objects. An Indian from the Anthropology Reservation was showing the stuffed animals to his blanketed family one afternoon. His grunts of amazement at giraffe and rhinoceros were eclipsed by a gleeful chuckle when he recognized the grizzly bear. At the same time, a serious aged couple from Missouri were puzzling over the dinosaurus. There is matter here to attract every one.

The naval exhibit is picturesque as giving a vivid presentation of life in the Navy and significant as indicating marked naval progress in the last few years. A little theatre is darkened every hour, and visitors watch naval scenes flit by in biograph pictures—an awkward squad of "rookies" are given their first drill, a boxing-match takes place on the deck of a battle-ship, President Roosevelt comes aboard a ship and makes a speech to the cheering sailors, a column steams by in battle formation, every ship wrapped in smoke and steadily firing. The people pour out from the biograph exhibit to go aboard the battle-ship model, where they see what modern battle-ships have become.

From the deck of the battle-ship one may see, below, a model of a new submarine boat of a type the government is now having built. In another direction is a floating dry-dock—a model of the one recently installed at New Orleans—in which a model of the Kearsage is raised for mimic repairs.

The Army exhibit, opposite, tells the full story of the Army. A cartridge factory is at work turning out cartridges after many processes in machine after machine. Near-by is an array of guns, ranging in successive steps from the wheel-lock musket of the fifteenth century to the arm now being manufactured for the United States Army—a magazine rifle that is loaded five cartridges at a time. Full-sized models of a train of mules are carrying a mountain-battery. Lay figures in wax reproduce a field-hospital. West Point is pictured in a part of the section as Annapolis is pictured in the naval exhibit. The most timely exhibit in all the war display, however, is the reproduction of a fortified harbor. Guns are placed in position in a fort on a hillside which slopes down into a huge tank with high glass sides. The tank represents the harbor. Scattered about in it are anchored contact mines. A small model of a battle-ship sails up the harbor toward the fort. Looking through the side of the tank, one can see it strike a mine. There is no explosion, but whenever the blow has been hard enough to explode a similar mine an electric lamp is lighted within the mine itself—one can see it shine for a moment through little glass-covered apertures.

In conjunction with this are displays which show how light-houses are equipped and maintained, rivers widened and deepened and banked with levees, harbors made securer and more commodious, seas sounded and charted. The models and devices are many and ingenious. Reproductions of sections of the Mississippi illustrate in miniature the grading of banks and the laying down of brush-mats to keep the river from scouring. Colossal hoes, worked from steamboats, level off the very bottom of the river. A snag-boat pulls out snags. An ingenious arrangement is perfected by which a steamboat trails a boom along the bottom of the river. The upper end writes a record of the undulations of the bottom. A huge floating machine, like a catamaran, trails a transverse boom below the surface in the Lakes—this to catch obstructions. A relief-map shows the great engineering achievement under way to make the harbor of Galveston

tornado-proof. A plan of the new ship-channel in New York Harbor is accompanied by models of ships. The *Dreadnaught*, the largest ship entering the port in 1800, was 150 feet long, 27 feet wide, and 11 feet deep. In 1880, the *Arizona* came in—465 feet long, 46 feet wide, 22 feet deep. In 1900, the *Oceanic* used the channel—704½ feet long, 67 feet beam, and drawing 30 feet. Vessels grew in size to meet the needs of modern commerce, and the channel has been widened and deepened to serve them.

The mint is at work stamping out gold and silver money. Every process is real. In the laboratory of the Geological Survey an attendant is at work slicing specimens of rock down to one one-thousandth of an inch. A press is turning out topographical maps of St. Louis for free distribution. The Survey has already made minute topographical maps of three-fifths of the country, and geological maps for a smaller area. At present, however, it has as many men engaged on reclamation projects as on all the rest of the work. The results of this are made plain in various places in the building in models of irrigation works and notably in one model showing the reclamation of alkali desert—the Salt River experiment. In this work, the water must do more than irrigate; it must first wash the alkali out of the land. And so, from one thing to another—the interesting exhibits are endless.

It is in the sections, however, which show what the government does to make farming more efficient and living more comfortable that one sees the government in closest touch with the people.

A huge relief-map is shaded to show the areas of light and heavy rainfall throughout the country, and, in the surrounding section, a weather-office is maintained. All the ingenious machines for recording wind-pressure, rainfall, heat, and the other data the Weather Bureau employs are exhibited and explained. A weather-map is printed here every day. It may surprise some to learn that four-fifths of the prognostications of the Weather Bureau are right, and that no considerable storm in the last ten years has missed being predicted. Free distribution of the Bureau's information has been a boon to both navigators and farmers. And various bureaus in the Department of Agriculture give even more beneficent service.

Here are cases of all the more harmful insects placed as if destroying the fruit or leaves or cotton-bolls on which they feed. Each insect is exhibited in all its forms. Of some, huge models are made that make a chinch-bug as large as a rat. Many of these pests the government bureaus have practically exterminated. They are now working on the others. A tank shows the larvæ of harmless and of malarial mosquitoes. One can learn from these and from the full-grown mosquitoes how to distinguish between the two kinds. One may learn not only how to exterminate both, but how to kill off any other pest, from houseflies to cut-worms. Silk-worms are feeding near-by on mulberry leaves, and spinning their cocoons; the government is endeavoring to establish silk-culture in the South. And all this is but a tithe of what the section shows. Government experts are apparently watching every individual bug in the whole bug world.

They are examining every steer and sheep and hog killed at the great slaughtering centres of the country—and every slaughtered carcass. All the diseases of cattle and the parasites that cause them are shown in specimens of tissue and bacteria. Then one may see a map showing the cordon of inspectors—who have been trained by studying such specimens—thrown about the sections of the country where cattle diseases are prevalent. Models show how cattle and sheep are dipped and disinfected. Microscopists explain how they examine pork.

Other experts are at work in a laboratory where foods and drugs are tested. There is an exhibit setting forth the methods and results of testing the effect of various diets on human beings. The Bureau of Soils makes clear, in most interesting exhibits, how its experts examine soils in order to tell farmers in various sections what they had better plant. And the Bureau of Plant Industry spreads proofs of its ceaseless efforts to improve crops, to start new kinds of crops, and to inform farmers how to handle their crops most efficiently and profitably. Its display is full of marvels. And all the information these various bureaus obtain is spread broadcast by the government as a prerogative of American citizens.

The government exhibit alone is worth a trip to St. Louis.

The March of Events

THE most foolish of all mid-summer lassitudes is political prophesy—for thoughtful men. Your professional politician is professionally sure; and your emotional party-man knows that his party will win. But, emotions and professionalism apart, the election will be determined by a few large forces. Campaign funds will play a smaller part than in recent elections.

The influences that will be felt strongest in shaping men's minds are the personalities of the candidates. The more these are discussed, the better each man will appear. For it is easy to say that Mr. Roosevelt is "unsafe"; but, when definite acts are asked for, his unsafe acts are very hard to find. He is so attractive a personality that the better he is understood, the more he gains. Similarly with Judge Parker. His courage and frankness have won the admiration of the whole people. The better they know him, the stronger he will be.

The tariff will cut a larger figure than any other doctrinal party difference. There is little reason to hope or to fear that protection has lost its hold on the Republican masses, and it has gained a hold on some Democrats—many in the South, for instance.

The "practical" influences that have a bearing on the campaign are factional differences, such as the inter-Republican quarrel in Wisconsin and the possible "tangle" in New York. But local factional quarrels in either party are likely to be patched up just before an election, if not sooner.

Many men who are Democrats by doctrine, but who voted for Republican candidates during the ascendancy of Mr. Bryan, may feel disposed to wait even a little longer to see whether the return to safeness and sanity be real in the ranks of the party itself. This feeling will, in a general way, be favorable to the Republicans. But the normal strength of the Democrats will be shown at the polls as it has not been shown for a long time in a national election.

The election will, of course, be decided by the votes of a very few States, such as New York and Indiana. Judge Parker must win several important northern States, as Mr. Cleveland did, or be defeated. The Republicans have simply to hold a part of what McKinley won; and, in this aspect of the case, the Democrats are at a disadvantage. The balance of advantages in the early months of the campaign are somewhat with the Republicans.

There has, perhaps, never been a Presidential campaign in our history when both candidates were men of such a high level of character and courage — representatives of the best American manhood.

A DEMOCRATIC LEADER IN FACT

THE rehabilitation of the Democratic party is an important and cheerful fact, and it will make this year's campaign historic, whatever the result of the election be. The masses of the party have recovered from Bryanism; and the convention would have directly given proof of its recovery but for two personal forces that were at work in the sub-committee and in the committee on the platform. One was Mr. Bryan's own fanatical persistence; the other was Mr. David B. Hill's pusillanimous surrender to Mr. Bryan for the sake of "harmony."

With the mass of the party willing to commit itself to the gold standard, a wise or modest man in Mr. Bryan's place would have been silent. But he courted defeat, and, after preliminary victories, suffered complete humiliation. The convention indirectly committed itself to the gold standard, under force from Judge Parker.

And the convention's indirection gave Judge Parker an opportunity to show, by a single telegram, that he is a man of uncommon courage and frankness, fit for the highest and greatest responsibilities. It won the world's admiration instantly; and he has given to his party leadership with character such as it has had but once before within the memory of living men.

The telegram that he sent to be read to the convention will become historic. The convention had nominated him, and had adopted a platform that made no mention of the monetary standard. Since Mr. Bryan had himself caused this omission, it was equivalent to a practical repetition of the old free-silver platform of the last two campaigns. The

party, therefore, stood not opposed to the old platform, but constructively in favor of it. With the nomination already made under these conditions, Judge Parker promptly sent this telegram, to be read to the convention:

"I regard the gold standard as firmly and irrevocably established, and shall act accordingly if the action of the convention today shall be ratified by the people.

"As the platform is silent on the subject, my view should be made known to the convention, and, if it is proved to be unsatisfactory to the majority, I request you to decline the nomination for me at once, so that another may be nominated before adjournment."

After a wrangle that lasted far into the morning, the convention, having become weary of Mr. Bryan's renewed arguments, voted by 774 to 181 to send Judge Parker this answer:

"The platform adopted by this convention is silent on the question of the monetary standard because it is not regarded by us as a possible issue in this campaign, and only campaign issues were mentioned in the platform. Therefore, there is nothing in the views expressed by you in the telegram just received which would preclude a man entertaining them from accepting a nomination on said platform."

Thus the convention yielded to Judge Parker's force of character and committed itself to the gold standard.

The single doubt that remains is a doubt of the sincerity and courage of the minor leaders of the party. As represented in the convention, they showed indecision till they were forced to act. They showed a lack of character so long as they were left to themselves. But the party now has a leader, and a new outlook.

The aged ex-Senator Davis, the nominee for Vice-President, is a man of sound character, of fixed principles, and—of great wealth. The oldest nominee for the office in our whole history, he would never have been considered for a Presidential nomination. But he stands for the gold standard, and his nomination is, therefore, an additional committal of the party to sanity and safety.

WHAT MR. ROOSEVELT STANDS FOR

WHEN Mr. Knight, of California, declared in the National Republican Convention, at Chicago, that the party needed Mr. Roosevelt more than Mr. Roosevelt needed the party, he spoke truth as well as eulogy. For the dominating personal influence of the President is now the largest fact in national politics. Although his party is not now particularly poor in men, it makes a poor showing, measured by its natural bent and action, apart from the President. Apart from him, it would have nominated Mr. Hanna, if he had lived, or a man of (say) Mr. Fairbanks's calibre. Clearly, then, the party owes its best tendencies and its chance of success to the President's personality.

His necessary nomination marked the formal triumph of his character and methods over the old machine. The more or less silent struggle began as soon as Mr. Roosevelt became President. He lost some encounters in the long contest; for he yielded to the enemy in making some appointments. But he has carried out his plan of being President himself, and not a mere part of an administrative machine. His nomination forced by the wishes of the masses of his party, in spite of the old Republican machine, is a complete triumph. The party has accepted him and what he stands for; and, by accepting him, it has received the first new impulse that it has had in many a year. In several campaigns, it won with commonplace candidates by the force of well-managed "business," and because of Democratic folly. It now has the most vigorous personality at its head that it has had since Lincoln; and what is best in the party is summed up in Mr. Roosevelt. He has given it a new impulse

What Mr. Roosevelt stands for, in political action as well as doctrine, has been admirably set forth by the *Outlook*, chiefly from his public utterances, substantially as follows:

The Race Problem: "I certainly cannot treat mere color as a permanent bar to holding office," he wrote. . . . "Just as little will I treat it as conferring a right to hold office."

The Labor Problem: He believes in labor organization, but organization must be free. No one must be forced into any organization.

The Trust Problem: The nation, which is sovereign, has a right to regulate corporations, which are the creatures of law; but it is wise to use this power of regulation cautiously. The first step in regulation is publicity.

The Tariff Problem: The protective system, with flexibility enough to admit of readjustment to changing conditions; and reciprocity to give us a greater foreign trade.

Expansion: The right to acquire territory

beyond our borders, but the duty to help dependent peoples "upward along the stony and difficult path that leads to self-government."

Our Foreign Policy: Friendliness to all other Powers, and a strong navy to keep the peace.

On all these subjects, except the tariff, Mr. Roosevelt has made a record by acts as well as by expressions of opinion. These, then, are the things that "the Republican party has indorsed in nominating him," and that "the nation will commit itself to if it elects him."

THE PRESIDENT'S PERSONALITY AS A PLATFORM

BUT much more important than doctrinal statements is the man. He has set a new standard of activity in public life. The whole service under him has been keyed higher. Energy, promptness, efficiency have come to have a new meaning. His character and method have acted as a tonic. He knows the country and the people of every part of it more intimately than any recent President. Have the arid States an irrigation problem? He knows it, and the government has begun a great system of water-works. Was the Army unorganized and disorganized? He was a soldier himself, and, under his administration, Secretary Root made a reform that will become historic. There is a Philippine problem—a group of problems, in fact. The man who knows most about them is now one of the President's chief advisers. We were dallying with the duty of cutting a canal across the American isthmus. We are now going to cut it, thanks to the President's ready activity. We have won an international influence by expansion, such as we never had before. President Roosevelt's Secretary of State has turned it to the wisest, and largest, and most humane uses, especially in dealing with Asiatic problems; and the whole future of Asia may be profoundly affected by our diplomacy. At home, an anti-trust law stood on the statute-books, jeered at for its inefficiency. He made it effective, and we have gone a long step further at least toward an understanding of the trust problem.

Such vigorous and straightforward activity has alarmed the timid and is shocking to ultra-conservative temperaments. So strong a personality arouses the bitterest opposition and even hatred. All really strong personalities do. Every strong President has provoked fear. Washington himself was decried as a sort of monarchist. Jefferson was thought to be an apostle of anarchy. Jackson was accused of destroying the last remnant of public dignity. Lincoln was a tyrant. Grant aimed at a sort of monarchy. Cleveland "surrendered to the money-power." History is repeating itself when a Texan orator informs his hearers that Mr. Roosevelt has Wilhelm II. as his model, and wishes to create an imperial government.

Yet Mr. Roosevelt has been the frankest and most candid of Presidents. He has taken the public constantly into his confidence. He has worked "in the open." There is no mystery about his conduct. He has simply set a pace that dull imaginations cannot follow, and that dilatory and indirect politicians are not accustomed to. But he has inspired American youth. He has set a new standard of conduct—in a way, he has given a new direction to national character. He is a new impulse, and a morally decadent party has taken a higher level of life because he has won its leadership; and he won its leadership by the admiration of the people, chiefly of the central and western States, in spite of the violent opposition of the South, and the quieter opposition of the old machine and of the economically privileged class in the eastern States.

THE DEMOCRATIC PARTY ITSELF AGAIN

THE nomination of Judge Parker is an act of character. By it, the Democratic party assumes again a proper station and begins a new era of dignity and usefulness. His behavior during the months preceding the convention recalls the dignity of the fathers; his prompt action when he was nominated on a platform that he could not accept revealed his stanch qualities; and his bearing as President, if he should be elected, would be in keeping with the traditions of the most dignified era of his party.

Judge Parker is a man whose Democratic creed has a meaning. He represents admirably the historic doctrines that have given the party vitality through all the changes in our history—a body of doctrine that has been persistent and unchanging longer than any other political creed that we have. It includes privileges to none; taxation for revenue only—no protection of the government, incidental or direct, to any person, or

class, or interest; as little government, in fact, as possible; no experiments—no "expansion," for instance; friendliness to foreign Powers, of course, but as little to do with foreign affairs as possible; the utmost economy; Conservatism written large enough to spell deliberation, if not hesitancy; the old paths and the least noise. Except as regards the tariff, the two parties now represent opposing temperaments rather than opposing creeds. The quieter national mood is what Judge Parker stands for.

The historical Democratic doctrines have the assent of half the people of the nation, more or less; and the Democratic mood fits the temperament of many men who mistake moods for doctrine. For those who "fear" Mr. Roosevelt, there could hardly be a more congenial temperament than Judge Parker's.

Our oldest political party, thanks to him, has come to itself again. It can no longer be said that its success would be a national calamity. It is again worthy of the support of the thoughtful and right-minded men whose temperament it satisfies.

THE "DECLINE" OF THE VICE-PRESIDENCY

ONE public man, at least, put aside this year a nomination for the Vice-Presidency that was within his reach; and many more affected an unwillingness to accept it. Thus it has become a sort of fashion to regard the office as a place of mere dignified retirement from real political life. The public journals belittle it, and there is a popular notion that it is useful chiefly as a means of adding to the Presidential ticket a man of fortune or a man who may win support in a doubtful State. This is an unworthy view to take of a high public office, and it gives a good insight into the effect that practical politics has had on the esteem in which the public service is held.

The Vice-Presidency has no patronage: it is, therefore, "no good." The man who fills it has no direct constituents. "Practically," it is an office without influence.

But, for that very reason, it is an office of very great possible dignity and importance. A man of a strong personality and of great public spirit could, as Vice-President, have an influence second only to the President himself. He could not build up his power in a spectacular way. But a really great man does not need spectacular methods or positions. Freed from the annoyance of patronage, and relieved of the drudgery of committee work, he could give his time and energy wholly to the promotion of the public welfare in large ways. He has a dignified post. He has social position. He has the advantages of public station without its burdens.

But a man of small aims or of mere party-methods finds himself, in the office, only a part of the machinery that has no function—a sort of fifth wheel to the wagon. How a man regards or uses such an office gives a measure of the man rather than of the office.

RECENT CHANGES IN THE CABINET

MR. KNOX'S retirement from the Cabinet, to accept a seat in the Senate from Pennsylvania, is fortunate for Pennsylvania. For a very long time—there is a temptation to say from time immemorial—that important commonwealth has contributed nothing better than effective bosses of defective character to the Senate.

But complaint is made that Mr. Knox will represent the great corporations, and he has been accused of surrendering to them—he who was lately their prosecutor. But it is fairer to judge a man's character by his actions than by the conjectures of his critics. As Attorney-General, Mr. Knox went about the plain duties of his office with vigor and success. He brought and won the government's suit against the Northern Securities Company and many more cases against violators of the anti-trust and the interstate commerce laws. He contributed more than one clear statement to the discussion of the management of trusts, notably his speech before the Chamber of Commerce, at Pittsburg. True, he had had important corporations as his clients before he became Attorney-General; and, doubtless, he will again have them as clients. But he has shown an independent mind and a sense of public duty in conspicuous and effective ways. These qualities will count in his favor in the judgment of fair-minded men; and his ability will put him among the very foremost members of the Senate.

Mr. Paul Morton, who goes into the Cabinet because of Mr. Knox's retirement (Mr. Moody becoming Attorney-General and Mr. Morton Secretary of the Navy), is a vigorous and successful man-of-affairs, of the Roosevelt

type—energetic, frank, hale. Without experience in public life (perhaps he is all the better for that), his successful administrative work in railway management will serve him a good turn. He has not had the party service that would commend him to the elders. But he has the vigor and the character that fit him for just such duties as the Secretary of the Navy has to do. The selection of such a man, who is not a politician, is as characteristic of the President as his selection of his Postmaster-General was not.

Mr. Metcalf, a member of Congress from California, who has become Secretary of Commerce and Labor in the place of Mr. Cortelyou, is a man of experience in public affairs; and, by his selection, the Cabinet has a Pacific Coast representative.

Mr. Cortelyou's resignation, to become the manager of the Republican campaign, is a characteristic evidence of the President's wish for the clean and dignified conduct of it. Mr. Cortelyou is not a collector of funds, but he is a man of the most orderly methods and scrupulous ways. Under his management there will be no "rousing round-up" in doubtful States.

What odd turns fortune shows, by the way, in two of these Cabinet changes! When Mr. Cleveland was President, Mr. Cortelyou was an under-secretary in the Executive Department. He has since become a member of the Cabinet and the manager of the Republican campaign. Mr. Morton's father was Mr. Cleveland's Secretary of Agriculture and a Democrat of the genuine sort—by nature and by culture a Democrat. His son has a portfolio in Mr. Roosevelt's Cabinet.

The Cabinet is now largely made up of men of Mr. Roosevelt's selection. Mr. Hay, Mr. Wilson, and Mr. Hitchcock were appointed by Mr. McKinley; but all the rest are Mr. Roosevelt's selections. They are Mr. Taft, Mr. Shaw, Mr. Moody, Mr. Morton, Mr. Metcalf, and—Mr. Payne.

WELL-MANAGED CUBA BECOMING AMERICAN

TWO large facts stand out in the history of Cuba's first year of independence.

The first fact is the good financial and administrative management of the government. The sanitary work begun under American control has been carried on effectively and more cheaply. Road-building has been continued. On January 1, 1899, there were only 159 miles of good roads on the island. Under the three years and more of American control, sixty miles more were built; and during the first year of independence forth-nine miles more. Not only has the sanitation of Havana been kept good, but its beautification has been begun. And, with all the good work done, the public finances have been very ably managed.

The other fact is that about one-fourth of the land of the island has become the property of Americans. In one month last spring, there were 100 transfers of real estate (one of them for 5,000 acres) in the Province of Pinar del Rio alone.

HOW JAPAN HAS ALREADY WON WHAT SHE FIGHTS FOR

THE war moves on toward mastery by the Japanese on land as well as on the sea. They are clearly invincible by the Russian generals and admirals and forces now in Asia, and Russia's only hope of success, if there be room for hope at all, depends on future campaigns and reinforced armies and fleets.

It is almost impossible to measure the effect that the war has already had on international relations and on the political and economic thought of the world. A little while ago, there was no other idea held of Japan by any European people than that she was an interesting little nation, but not for a moment to be thought of as a primary influence in world-politics. It was this feeling that caused Russian, German, and French interference after her war with China; and England looked on while she was robbed of the fruits of her victory. In Captain Brinkley's interesting "History of Japan" (Vol. I., page 14), this passage occurs:

"No one who should tell the Japanese today that the consideration they have won from the West is due solely to their progress in peaceful arts would find serious listeners. They themselves held that belief as a working incentive twenty years ago; but experience has dissipated it, and they now know that the world never took any respectful notice of them until they showed themselves capable of winning battles. At first, they imagined that they might efface the Oriental stigma by living up to civilized standards. But the success they had attained was scarcely perceptible when, suddenly, their victorious war with China seemed to win for them more esteem in half a year than their peaceful industry had won for them in half a century. The

perception of that fact upset their estimate of the qualifications necessary for a place in 'the foremost files of time,' and had much to do with the desire they henceforth developed for expanded armaments. . . . That was the quickest exit from the shadow of Orientalism, and Japan took it."

Japan, therefore, if the war should end now, would already have won the main thing that she is fighting for—the respect of Western nations. For the Western view of her character and importance has changed—changed radically. She is no longer regarded with the condescending admiration that great Powers have for small Powers. Her navy and her army are forever hereafter to be reckoned with. She has shown naval and military genius—it is nothing less than this; and startling new chapters in warfare must now be written. She is winning battles that may take a place among the decisive battles of the world.

This much has been gained by the Japanese before the war ends; and, however the war end, this gain cannot be lost.

Correspondingly, Russia has declined in her position and power among the nations; and even a victory would not restore her prestige. Japan has already become one of the important Powers, and Russia's troubles, both domestic and foreign, have so increased in number and burden that she will not be feared by any of the strong nations for many a year to come.

A JAPANESE LESSON IN LIVING

THE trustworthy medical journals are reading us lessons out of the Japanese habits of right living. The endurance of the Japanese soldiers and sailors shows a physical hardihood that few Western nations, if any, can equal. Yet they are not large men. Nor does their climate nor any other external natural influence make them particularly robust. The secret of their physical efficiency is their method of living and eating.

They eat less than Western peoples, especially less meat. Rice is their principal food, and it is easy to cook and easy to digest. They drink large quantities of water. A man will often drink as much as two gallons a day. By the use of moderate quantities of easily digestible food and of large quantities of water, they keep the digestive organs from clogging; and the clogging of the digestive organs is the cause of most of the ailments from which we suffer.

Then the Japanese live in houses that cannot accumulate foul air, and they are taught to breathe deeply. Perhaps, too, they are the cleanliest race of people on the globe. It is said that every one bathes at least once a day. Physical exercise is, of course, practised by them to a remarkable degree. Thus, the mass of them seem to have learned the art of healthful living better than the mass of any Western people. What our physicians tell us to do, they have, from childhood, been trained to do.

It would be an interesting speculation or calculation to ascertain how much physical, mental, moral, and economic gain would come to the American people if they all ate only what is easily digestible, drank water enough (*water*, mind you), breathed no foul air, and knew how to breathe, took regular and simple exercises, and kept their bodies scrupulously clean. Probably the efficiency of the people would be doubled; and the common practitioner of medicine (whose work consists chiefly in relieving us of the ailments that follow wrong eating) would have to earn his living in some other way than because of our ignorance and gluttony.

THE REORGANIZATION OF CHINA

ONE of the great administrative achievements of our time is Sir Robert Hart's management of the Chinese customs service; for this is the part of the Chinese Government that is free from corruption. And Sir Robert has, by long residence and service, become, perhaps, the foremost authority on the Chinese Government and its problems.

It is an event of at least great speculative importance, therefore, that he has drawn up a plan for the reorganization of the empire which he has submitted to the Dowager Empress, and which is reported to be regarded with favor. When the Japanese-Russian war ends, whatever settlement be made, China will almost surely have to resist encroachment. Helpless jellyfish as she is, she can of herself successfully resist nothing. It is an opportune time, then, to reorganize the empire, if such a task can ever be done, and to appeal to the ruling classes to build up a military and educational system that may have some vigor.

Sir Robert proposes a land tax that shall yield an annual income of $275,000,000; with this money, to reorganize the army, making

four corps, each of 50,000 regular troops; to establish four military and three naval academies; and to construct three fleets, each of ten large and ten smaller war-ships and torpedo-boats. With this provision for military and naval instruction and organization, which would have to be directed, at first at least, by foreign teachers and officers, he would establish modern schools also and reorganize the post-office and the telegraph service; and he would pay all civil officers fixed salaries, with the hope of preventing the present universal practice of extortion. All this is a chapter taken out of the recent history of Japan; but there is this important difference between the two peoples—that the Japanese themselves worked out their modern organization, and it is an Englishman who has proposed it for China, and the Chinese probably lack the character to carry it out.

Certainly military discipline, training in modern methods, an army and a navy that shall be respected, and schools that shall teach the facts and arts of practical life are the proper means of making a real government. But these cannot be made by a people who have no sense of solidity or of nationality. The judgment of most men who know China well is that the best chance for the development of a real nation is by the influence and under the direction of the Japanese. If the Western nations are prevented from partitioning the empire until Japanese leadership in China can be established, there may be developed something like a national feeling. This is what alarmists call the yellow peril. But no real peril to the world will come from the development of any people. It comes only from leaving them undeveloped.

It is along this line of speculation that some of the most important events of the future appear as probable sequels of a war whereby Japan is winning a title to leadership. There may come a sharp turn in the history of a large part of the human race, as a result of this war.

WIRELESS SERVICE ACROSS THE PACIFIC

THE layman has hardly yet accustomed himself to think of the wireless telegraph as a world-girdling instrument of communication. We have regarded it chiefly as a thing for short-distance use, as between ships or between ships and the shore. But its enormous naval value has been proved by Admiral Togo. Constantly his scouts have made reports to his main squadron about the movements of Russian ships, which showed that he had as easy communication over water as we have over land—easier, indeed, for, wherever a ship is, it has its instrument always ready, and there are no wires to lay. This achievement takes strong hold on the imagination. And now wireless telegraphy enters a new era in its development for long distance work, with the contract that the government has made for a coast service from Maine to Panama, with instruments at every naval station, to Porto Rico and Cuba, and in the Pacific to San Francisco and to Seattle, thence up the coast to Alaskan stations, on to a station in the Aleutian Islands, and thence to Kamchatka. The contract provides for communication with Guam, Honolulu, Manila, and thence to China. It is a startling thought that any vessel of our navy, almost anywhere in the Pacific, may have instantaneous communication with land before a similar convenience has been established in the Atlantic.

ROMANCE AND COMMONPLACE IN COEDUCATION

PRESIDENT J. STANLEY HALL, of Clark University, whose studies of adolescence have given him a right to an opinion on the relation of the sexes in youth, explained his objections to coeducation at the recent session of the National Educational Association. A large percentage of girls who associate constantly with boys at school come to wish that they were boys (so he argued); their ideals become masculine; they become careless in conduct, in manner, in dress; boys become unchivalric; and thus "romance dulls down into commonplace."

Those who maintain that "romance" has no place in life, and that coeducation prevents silliness and makes for an enlightened common sense, have their arguments ready to set against President Hall's, as well as examples of many attractive coeducated women and chivalric coeducated men. But the noteworthy fact is that coeducation, in college at least, has not yet commended itself to the people whose social life has been longest established in the United States and is the most stable. As social life develops, coeducation may be expected to lose favor

among the most conservative classes in the Middle West. It keeps its hold on that larger section of society which looks to education rather for purely intellectual and utilitarian results than for refinement. This is probably the law that will determine its growth. It has undoubtedly fixed itself firmly in American life, and it shows many examples of success in refinement and in sentiment, as well as in intellectual training pure and simple; but the highly organized social ambition and the most refined social sentiment will never accept it. Here are facts and feelings, therefore, for a perpetual controversy.

THE SMALL NUMBER OF NOVEL-READERS

THE market for new books, especially novels, is dull this summer; and the dullness is interpreted by some to mean that the people are saner and more serious than usual, and by others to mean simply that they have less loose money and less spare time. You may find men aplenty who will argue, each according to his temperament, a great social danger or a great social help—a public virtue or a public vice—from the statistics of the novel-market. A very few data go a long way with minds like these.

What are the facts? It is a very successful new novel of which 100,000 copies are sold; a distinctly successful novel that attains a sale of 50,000 copies; a successful one that attains a sale of 10,000 copies. Now, any Colonel Sellers knows that there are 80,000,000 persons in the United States. Let us suppose that half of them are children and illiterates—there are left 40,000,000. Of these 40,000,000 who can read, let us suppose that 20,000,000 do read. Of these 20,000,000 who can and do read, suppose only 10,000,000 read novels. A novel which attains 100,000 copies is bought by only 1 per cent. of these 10,000,000 possible novel-readers; a 50,000 novel, only one-half of 1 per cent. of them; a 10,000 novel, only one-tenth of 1 per cent. of them—or only one person in every 8,000 of the total population!

Measured in this way, the influence of new fiction, good or bad, does not seem to be sufficiently widespread to cause reformers either to rejoice or to despair. But since novel-reading is so cheap and (to many persons) so pleasant a diversion, the wonder is that so few are published and that such small editions of them are demanded. Whatever the professional literary gossips may say, the writing of novels and the printing and the sale of them are yet inconsiderable and unorganized industries; and the reading of them can hardly be called a popular diversion. No doubt the day will come when really interesting stories will run into editions of a million copies each, and thus reach at least one person in eighty of the population.

THE MEN WHO MADE THE FAIR

THE St. Louis Fair has been made by the enthusiastic efforts of a group of very able men. President David R. Francis, whose record as Governor of Missouri, and as Secretary of the Interior in President Cleveland's Cabinet, marked him as a man of distinguished ability, has devoted his powers for the last three years to making the Fair a success.

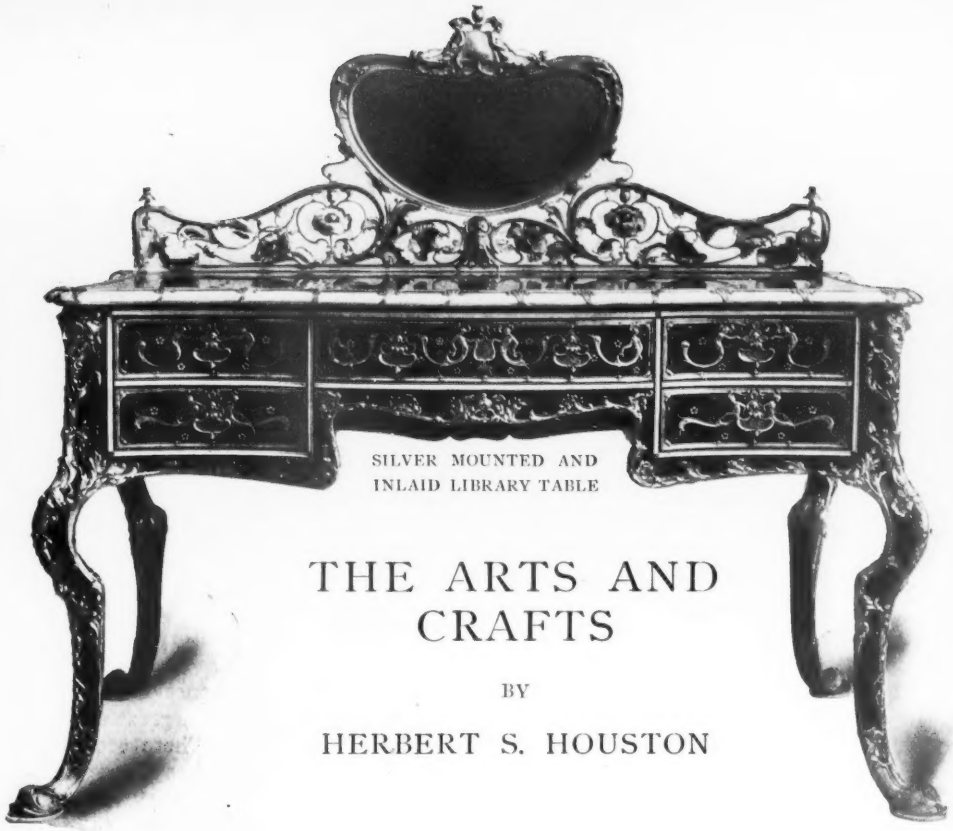
As Director of Exhibits, Mr. Frederick J. V. Skiff has had executive charge of all the exhibit departments of the Fair.

Professor Frederic W. Taylor, Chief of the Department of Agriculture, has collected the great display of agricultural, horticultural, and live-stock exhibits.

Captain Willard A. Smith, Chief of the Transportation Department, Mr. Thomas M. Moore, in charge of machinery, and Mr. W. E. Goldsborough, in charge of electricity, are all men of experience at expositions. Mr. Howard J. Rogers, in charge of education, received the Legion of Honor decoration for his services at Paris in 1900.

Mr. Halsey C. Ives collected the art exhibit. Mr. Milan H. Hulbert, manages the exhibit of manufactures. Mr. John A. Ockerson is Chief of the Department of Liberal Arts. Dr. Tarleton H. Bean organized the Forestry and Fish exhibit. Mr. Joseph A. Holmes, in charge of the Mining display, has been State Geologist of North Carolina. Dr. W J McGee, the distinguished scientist who has built up the anthropology exhibit, is President of the American Anthropological Association. Mr. James E. Sullivan, Chief of the Department of Physical Culture, is an expert in athletic affairs.

The results these men have achieved show clearly the perfecting of a definite profession. A great Fair can be made only by skilled Fair-makers of expert knowledge and trained executive ability.



SILVER MOUNTED AND
INLAID LIBRARY TABLE

THE ARTS AND CRAFTS

BY

HERBERT S. HOUSTON

THE arts are handmaidens serving the crafts in many of the exhibits. Particularly is this so in the beautiful work shown in silver and gold and clay in the Varied Industries Building. One day a famous French connoisseur came down from the galleries on Cascade Terrace, and looked and marveled at the fine things wrought by American craftsmen, especially in the way of using precious stones in carrying out designs in silver and gold.

"There is not much use for Frenchmen now," he said, "as we can do no better than this in Paris."

This is high praise, and it is much more, because it is an authoritative recognition of the country's artistic progress. The Gorham silversmiths, of whom it was said, have again shown by their exhibits that their work is the standard for measuring what America is doing in combining art with craftsmanship. And this union of the two is deeply interesting in showing what can be done under the stimulating conditions of freedom. For the Gorham Company has always encouraged full expression of the artistic spirit, and the designs shown in its exhibits in St. Louis, as were those at Chicago, Buffalo, and Paris, are creations, not copies.

Practically all the designs shown were made especially for this World's Fair. They can stand, therefore, as marking the present stage in the development of the artist-craftsman of this country. And it is a stage of high attainment, as the French critic already quoted and all other discriminating judges unite in conceding. In the designs there is so much of artistic distinction, of quickening individuality—all bearing witness to the wisdom which has made the Gorham factories schools of freedom.

Coming from the broad principles behind the exhibit to the definite embodiments of those principles that are shown, there are many things to claim attention. The line of progress is the same as that revealed at Paris in 1900 and at Buffalo in 1901—it is in the artistic perfection of ware, entirely hand-

wrought, shaped and fashioned with the hammer, and delicately ornamented and traced with the chasing tool. It is the fine craftsmanship of the Silver Martele, which was originated by the Gorham Company, worked out in various designs.

There has been distinct advance in the artistic elaboration of design, and this is especially noteworthy in the many beautiful pieces in Florentine. There is a complete dinner-service in the Florentine shown that is being much admired for the beauty of its lines and the exquisite tone in the coloring. Lorenzo, the magnificent, in the time of Florence's glory, it may well be believed, would have welcomed this beautiful service to his palace on the Arno.

Then there is a Louis XVI. dessert set, with garlands and festoons in an openwork design, that is of unusual artistic excellence. It suggests the collections at Versailles, and one is apt to walk across to the Grand Trianon, which has been reproduced for the French Building, and look over the furnishings which reflect the glories of the great period of the Louis, when French art came to its flower. But this beautiful Gorham set is in no sense a copy, but a true creation, embodying the decorative spirit of eighteenth-century France. And, in as great degree, it embodies the artistic spirit of the American craftsman, working with hammer and chasing-tool.

SOUP TUREEN OF THE FLORENTINE

The magnificent writing-table and chair, shown in the illustrations on the first page of this article, are wonderful examples of Gorham craftsmanship. The table is of ebony, mounted and inlaid with silver and ivory and other precious materials. It has taken a number of years to complete it, and the cost has been many thousands of dollars.

While silver has been chiefly used by the Gorham craftsmen, they have been equally successful in working in gold, and many fine examples of their work are shown. One is a gold toilet service of twenty pieces, which, in design and execution, is as fine an exhibit of hand-wrought work as can be seen at the Fair.

There are numerous tea services in Martele silve with the gray finish, and also several sets of very plain, bright finish, the latter, in particular, showing the very highest grade of silversmithing. There are several elaborate punch-bowls, a fine display of vases and loving-cups, and a really wonderful specimen in Martele' of rose-water ewer and plateau, which is an artistic creation that will rank with the best that silversmithing has ever produced. That it has been made by our craftsmen is a gratifying fact that will swell the pride of every American visitor who sees it.

The leather goods in this comprehensive exhibit seem to cover the entire animal kingdom. There are purses and bags, with a great variety of mountings, made up in whale, elephant, rhinoseros, snake, lizard, and on through the natural history. In many of the mountings precious stones have been used with great effect.

There are only two pieces of copper shown, but they are equal to any number of pieces that have been heretofore exhibited. They are very large vases, with silver applied ornament, the union of the two metals in the design making an extremely fine effect.

In a small pavilion opposite the main exhibit there are shown specimens of bronze castings and church goods. The heavy bronze doors to the pavilion, in elaborate design, are intended for the new Gorham building in Fifth Avenue, New York. There are a number of memorial tablets and a great variety of altar furnishings in gold, silver, and brass.

In looking over this varied and beautiful Gorham exhibit, one feels instinctively that there is wrought into it much of artistic tradition and atmosphere. And looming behind it, on Narragansett Bay, rises the great plant of the company, which is the home of the Gorham tradition and the Gorham silversmiths. However interesting these exhibits at St. Louis may be, they are not so interesting as is the rise of the company to greatness during three generations.

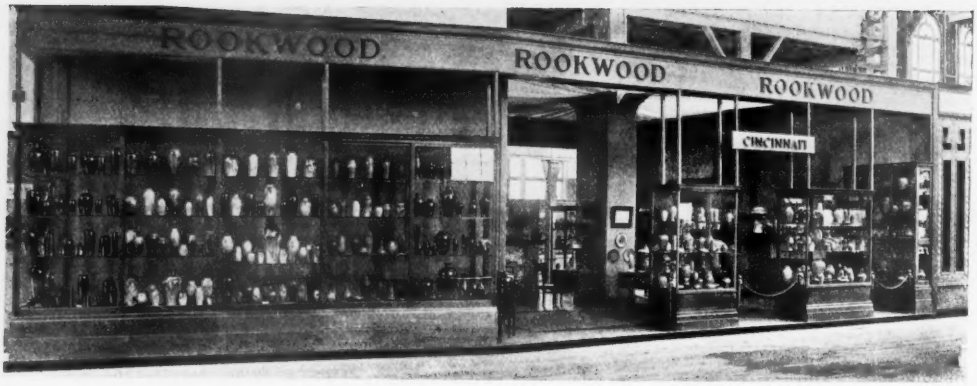
It is about three-quarters of a century since

the Gorham Company came into the world. Its birthplace was a little old-fashioned wooden house in the old town of Providence, R. I.; so rapid was its growth that in fifty years the unpretentious structure was superseded by a whole block of buildings. These, too, were outgrown, and, in order to make ample provision for larger growth, the company selected a large tract of land in a more sparsely settled part of Providence. These building operations have been, from the first, thoroughly typical of the Gorham Company's business policy, which demands thorough workmanship and progressive methods in treatment and art. In the construction of the new buildings, a primary requisite was that they should afford the best conditions for the welfare of the employees. Mr. Edward Holbrook, the president of the company, is himself a graduate from its school of practical business, and recognizing that its continued success depends upon the skill and faithfulness of its workers, he sees that their welfare and comfort are thoroughly provided for. Thus, all work together in a spirit of human fellowship and mutual helpfulness. There are more than two thousand workmen in the Gorham Company at the present time, and, among them all, merit, skill, and faithful service are the means of promotion.

MARTELE FLOWER VASE

The familiar lion, anchor, and letter G of the Gorham Company are an absolute guarantee of the intrinsic worth of the article bearing them, and are thus recognized throughout the world. It has been by persistent and faithful adherence to the best ideals that this trade-mark has secured universal acceptance as the standard. But, even with its present high attainments, the Gorham Company is not satisfied. It realizes that the ideal in art is an endless quest, and that no accomplishment can be final. With the added facilities that will come with the new building in Fifth Avenue at 36th Street, New York, a fine architectural creation after designs by McKim, Mead & White, with the ripening skill of the Gorham silversmiths, devoted always to their traditions and their art, the company will continue its artistic development.

MARTELE TEA SERVICE



THE CRAFT OF ROOKWOOD POTTERS

AFTER passing through miles of "streets" filled with machines and the products of mechanical appliances, it is an unspeakable comfort to visit the Rookwood Pottery exhibit. Here everything is individual and artistic to the final analysis.

It would be impossible to make two pieces of Rookwood alike, even if such a thing were desired, since every production is shaped and decorated by hand, the potter carrying out the ideas of the decorator when forming the clay into vase, placque or tile, and if, on completion, a piece does not come up to a certain standard of artistic merit, it is discarded by the Art Director.

Though each production is unlike any other, Rookwood Pottery exhibits ten different glazes, each of which differs from the others in texture or color, though each has its own general quality that distinguishes it from the others. Examples of each class are shown grouped together in attractive walnut cases on tables or ranged along shelves in decorative fashion in the great central space in the Varied Industries Building.

The first, or "Standard Glaze," is the oldest, and, perhaps, the most familiar—this glaze is distinguished by its rich deep yellows, greens, and reds—the warm yellow tone originated largely in the color of the body clay, deepened and made luminous by the glaze. In this connection, it is interesting to note that all Rookwood Pottery is made from native clays, and that the decorations are made by combining color with "slip" or diluted clay of the same quality as the body of the piece. "Tiger Eye" and "Gold Stone" are two other glazes, the names of which indicate the color, though it is impossible to suggest the mellow luminous golden quality of the one or the limpid glistening of the golden particles in the other. The "Tiger Eye," first made in 1884, was the earliest to be discovered among the now popular crystaline glazes. In "Sea Green" ware are the opalescent greens and blues of the deep sea, softened by the glaze and relieved by the design in warm colors. The "Iris" is a light-colored ware, the light grays, pinks, soft blues and greens predominating. The effect is most tender and suggestive, though sufficiently clear and sharp. The "Iris" pottery is made from white clay, and a white finish is applied. The "Flowing Glaze," another of the Rookwood variety, has a dark and slightly uneven surface. This pottery is decorated in low relief, the glaze flowing smoothly over it and giving it a soft, luminous quality very charming.

To make pottery that shall be successful—that is, without flaws or cracks of any kind in the body or the glaze—it is necessary that the body, decoration, and glaze shall combine perfectly when fired. It is this absolute certainty of results that has enabled Rookwood artists to get the effects they sought, the chemists having worked out the combinations finally before the artists began work. No piece of Rookwood, therefore, is an accident.

The chemists had long perfected the "Mat Glaze" before this variety was displayed for

sale, thus carrying out the long-established plan of working out any attractive original idea and holding it until the time was ripe to display it to the public. "Mat Glaze," having a dull waxen finish, does not depend on its decoration for its effect. The designs are either simple flat coloring, incised, or shown in low relief by bold and simple lines. Occasionally, the color and texture of "Mat Glaze" pottery are emphasized by the application of metal modeled by the artist who designed the piece. The "Mat Glaze" is peculiarly applicable for the decoration of buildings, and Rookwood Architectural Faience is made with this finish. This, incidentally, is a growing branch of Rookwood work, the application of Rookwood Faience to fireplaces, tiling, friezes, panels, fountains, etc., being more appreciated by architects and interior designers. An interesting exhibit of Rookwood Faience is shown in the pottery section of the Mines Building.

It was often remarked that the appearance of Rookwood biscuit, after firing, but before being dipped in the glaze, was most delightful, but was harsh to the touch; this suggested an idea, and Rookwood "Vellum" is the outcome. The Vellum finish has a softness and beauty of texture that is indescribable. It is clear and luminous, yet has nothing of hard, glossy brilliancy about it, and suggests the surface of old parchment.

It is the Rookwood policy to give the freest possible opportunity to originality. The designers and workers generally are surrounded by an atmosphere surcharged with the artistic feeling of the pottery, and every designer must catch this spirit before any of his or her work is shown to the public. Usually, an artist works a year at the pottery before the proper feeling prevails, but, once caught, it is seldom that one can be persuaded to work elsewhere. Each piece of Rookwood is signed by the designer just as an artist signs a picture, and each is equally original.

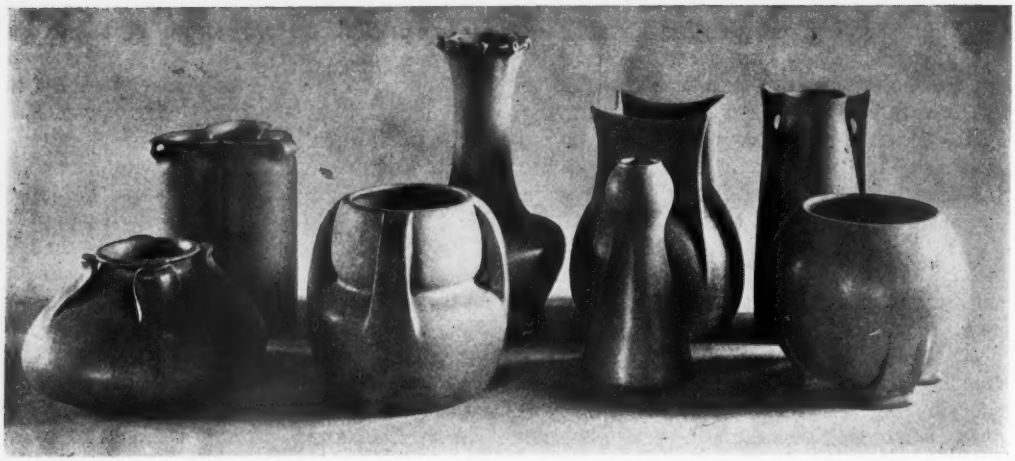
The Rookwood Pottery Company, therefore, won its success by adhering closely to its high ideal of artistic individuality. Instead of winning success through decreasing cost by repetition, the Rookwood Potteries succeed by making every piece different, and every piece perfect at increased cost. The high perfection attained could not be secured by a company run on ordinary commercial principles. It is no uncommon thing for a large per cent. of the contents of a kiln to be destroyed, and this after the designers have finished their work.

The beautiful structure on Mt. Adams, overlooking the city of Cincinnati, built in the English, half-timbered style, has nothing of the look of a factory about it, and, in fact, it is really a working place or a great series of studios. A permanent exhibition and warerooms are maintained at the Potteries, and visitors are cordially welcomed.

The Rookwood Pottery Company are the pioneers in the making of pottery of really artistic merit in this country; their product has been sought by expositions everywhere, and has universally secured the highest honors —leading to its purchase by twenty-seven of the most important museums in Europe and America.

And so, in a typical American city, an institution has been founded that has had an uplifting tendency on the art pottery of the whole country and has aroused the admiration of the greatest masters of Europe and the Orient.

SOME OF THE FAMOUS TECO WARE



A NEW UPLIFT TO AMERICAN POTTERY

THE successful man in any pursuit is he who is surcharged with enthusiasm, and who strives, with all that is in him, to produce the best work. Out of love for the work comes enthusiasm, and, as a direct result of this all-powerful quality, success is sure to follow. No great piece of work is accomplished unless the doer puts his heart in it; no great picture was ever painted, statue carved, building designed, or financial success won, where there was no enthusiasm behind to spur the worker on.

It was this love of the work for the work's sake that inspired Mr. William D. Gates, and that brought the now famous Teco ware into existence. For years, Mr. Gates had been making terra cotta for architectural purposes, and a great success had been won in this line, but outside, and for the sheer love of it, he experimented with various clays and an infinite number of glazes in an effort to secure some pottery that would approach his ideal in form, color, and texture.

At length, after ten or twelve years' experimental work, a pottery was evolved that met with the originator's approval, and, for the first time, Teco ware was placed on the market.

It has always been the aim of the Gates Potteries to produce a ware that in beauty of line and exquisite quality of color, rather than by elaborate decoration, should conform to the highest art standards and still come within the range of the average purse. In addition to this, it has been a principle of the Gates Potteries to make the Teco ware only in such forms as would be useful for some purpose, and the more extensive its usefulness, the better—the idea being that enjoyment would be increased and taste improved by the everyday use of beautiful form and color in pottery.

This high standard has always been maintained in Teco ware, and the lovers of good pottery of high standing in the art world have encouraged and helped this idea in every possible way. A marked instance of this is the eagerness with which well-known artists and architects have presented designs for various forms of Teco ware, and many of the most beautiful and popular shapes are taken from these designs.

A number of beautiful shapes have been designed by Messrs. Garden, Alberts, Cady, Blanche Ostertag, Mundie, Dunning, and Dodd, most of whom are artists and architects of note in Chicago. As a result of this friendly interest on the part of the ware's friends, and of the potter's own artistic work, a collection of most beautiful forms has been produced at a very reasonable cost, and all are useful in one way or another.

Teco pottery is of a beautiful moss-green color, that suggests strongly the charming

tones that old bronze assumes after long exposure to the weather; the surface is of a soft velvety texture without a bit of glossiness, and is such that it tones in with any color scheme, and is admirable for holding flowers of any tint. The Teco ware is impervious to water, and will not chip or crack unless subjected to the hardest usage.

The decoration always consists of simple lines, curves, and occasionally flower and leaf forms in low relief or incised, the glaze flowing over it and softening the outlines so that it is more suggestive than definite. Most pieces, however, depend entirely on their beautiful form, and have no decoration whatever. The pieces having plain surfaces appeal greatly to those who have suffered from over-decoration and delight in the simplicity of beautiful lines and color.

Teco ware is made from native clay mixed with a more refined quality, the combination producing unusual hardness and freedom from flaws. Some pieces are shaped on the wheel, others are molded.

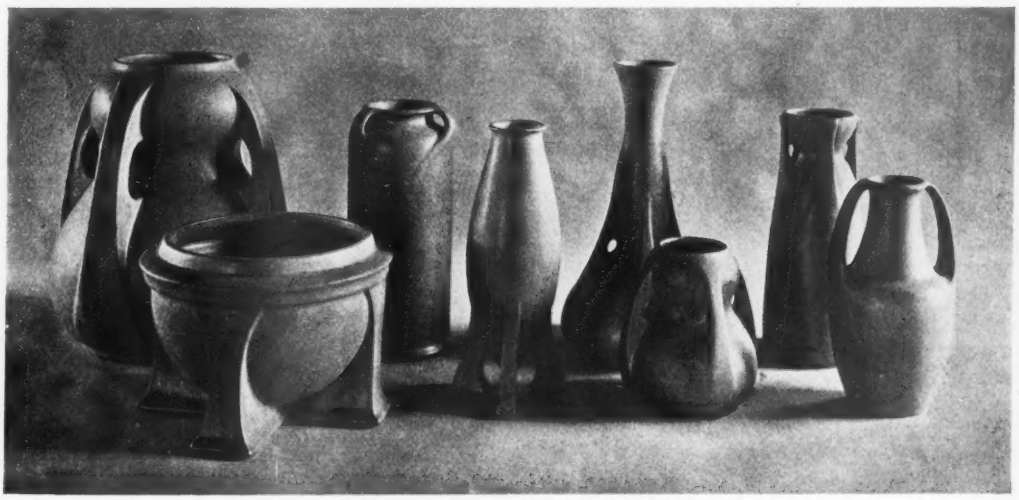
In the Palace of Varied Industries, the Gates Potteries have built a pavilion, inclosed in quaint leaded glass, where the varied forms of Teco ware are shown to advantage. Many pieces are in actual use in the form of lamps, the founts and shades being furnished by the pottery to harmonize with the color and shape of the vase.

This article, however, would be incomplete without a mention of the new Teco Crystal ware, which is now exhibited for the first time. This ware is utterly unlike the regular Teco, being of entirely different colors and texture. Teco Crystal can be best described by comparing it with the frost that appears on the window-panes in winter. An advantage over nature's handiwork is derived from the fact that the crystalized clay is protected by a transparent glaze. The most beautiful colors are produced.

No two pieces of Teco Crystal are alike, the frosting being produced during the process of firing, and varying in every case. The potter himself cannot tell just what shades and markings will appear. The body of Teco Crystal is porcelain clay, and the ware is much more expensive than the older pottery made by this company.

As in the case of the regular Teco ware, great care is taken in the shaping of the pieces so that they are quite as beautiful in form as in color. Nothing like Teco Crystal has previously been produced in this country, though some Danish potters have evolved something like it.

In the production of Teco ware, a high ideal has been realized, and an appreciable uplift given to American pottery. The Gates Potteries, whose works are in Terra Cotta, Illinois, are so situated as to supply an inspiration to its artist potters. The plant is located in the midst of a charming valley on the shore of a lake whose surface is fretted with many aquatic plants. The chief office of the company is located in the Chamber of Commerce Building, in Chicago.



WARE THAT IS BEAUTIFUL AND USEFUL

MORNING ROOM

ENGLISH FURNITURE AND DECORATIONS AT ST. LOUIS

AMID the bewildering collection of artistic and industrial exhibits which constitute the chief interests of the World's Fair, there is certainly one which will attract the attention of all lovers of decorative art. This is the pavilion erected by the English firm of Waring & Gillow, Ltd., in which are grouped together a series of beautiful rooms illustrative of its work. The idea has been to show examples of the principal rooms of a twentieth-century mansion—a hall, dining-room, drawing-room, and morning room, billiard room, bed and bath rooms, and nursery. The building in which these interiors are set out is itself a picturesque structure, in the early eighteenth-century English style, and the raised and columned forecourt, which partially surrounds it, in addition to being a characteristic feature, forms a useful platform for the display of many examples of antique English furniture and skilfully made reproductions. What is particularly noticeable about the whole exhibit is its fidelity to tradition. The "New Art" finds little favor with Messrs. Waring & Gillow. They prefer to go back to the seventeenth and eighteenth centuries, so rich in splendid models of form and proportion, and to revive the beautiful styles then in vogue, with such modifications as the needs of a comfort-loving, modern society suggest. In this suite of rooms, they give us renderings which are always faithful to the detail and ornament of the periods selected, but the "note" of the revival is to be found in the skill and experience with which the past is adapted to the present. Grinling Gibbons executed wonderful carvings in wood; Chippendale was famous for his furniture designs; Sheraton was a master of graceful form and delicate inlays, and Robert Adams's exquisitely refined and classical ornament had a charm of which one never wearies; but the exact conditions under which their productions

first saw the light would hardly be an acceptable environment for any one today. Realizing this, Messrs. Waring & Gillow have utilized the old styles, whether French or English, just so far as style was a paramount consideration. For the rest, they have created a set of comfortable and beautiful rooms—rooms which it would be a delight to live in—rooms the decoration of which is governed always by the fine distinction of restraint—rooms in which the old spirit and the old feeling yet live, side by side with up-to-date conveniences and modern improvements. Chippendale is ushered in by the electric light; Sheraton is enshrined in the modernity of a fitted bedroom.

The visitor enters the Pavilion by way of a raised forecourt and proceeds at once to the Entrance Hall, which is decorated in white enamel with refined eighteenth-century detail. A colonnade, recessed bays, and a handsome chimneypiece, flanked with china-cabinets, are the more interesting structural features, and the movable furniture includes many fine antique examples of the seventeenth and eighteenth centuries. The next room, the Dining-room, is a finely proportioned apartment, remarkable for its oak paneling and carved limewood ornament, the latter exquisitely carried out in the Grinling Gibbons style. The large panel of Boucher tapestry, the Chippendale chairs, and the gilt side-table, copied from one at Kensington Palace, the birthplace of Queen Victoria, are among the special features of interest.

The visitor next proceeds to the Drawing-room, in the Louis Seize style. Here the conventional rectangular plan is softened by the employment of curved wall lines and broken up by semi-circular recesses. The marble chimneypiece is a reproduction of an historic example, and the ceiling is coved in accordance with the style. Tapestries, copied from old Beauvais panels, serve as a suitable background for the old French furniture. Proportion and dignified refinement are the characteristics of this beautiful apartment. Most of the furniture is genuine Louis XVI., the sofa and fauteuils being upholstered in Aubusson tapestry.

A bedroom furnished in the Sheraton style, but with fitted furniture, is distinguish-

THE OLD ENGLISH BEDROOM

THE BILLIARD ROOM

able for the brilliant effect of the satinwood fitments and their delicate inlays of rare woods. Silk hangings, copied from old examples, make a pleasant contrast to the satinwood. It may be noted that the "Adams" ceiling is an adaptation of one designed by Robert Adams himself for a dressing-room for a former Countess of Dudley. The adjoining Bedroom is finished in the old English style. The walls are decorated with a paneled dado, surmounted with old English linen embroidered with sprigs of flowers. There is a tiled fireplace, copied from an actual grate in a seventeenth-century London house. A prominent and interesting piece is the four-post mahogany bedstead, reproduced from an original which formerly belonged to one of the rebel peers of the seventeenth century, and the bed-hangings are copied from old needlework which belonged to Admiral Blake. The rest of the furniture is thoroughly characteristic of a seventeenth-century interior.

A good deal of interest will be felt, no doubt, in the Nursery, where utility has been made the chief point, as shown in the avoidance of sharp corners, edges, projecting low shelves, and other sources of possible danger. The furniture is specially designed for the use of children, and all the details have been considered from the same point of view. The chief tone of the room is green, contrasted with pieces of furniture in a warm indigo blue, and harmonized by touches of bright color in the chintz curtains.

The Bathroom is designed on a new principle, the oval bath being sunk into the floor and entered by means of marble steps. A delightful effect is produced by hidden electric lights below the surface of the water.

In taking the prescribed route through the Pavilion, the visitor now comes to a suite of three rooms which were originally fitted up for the Duchess of York when she and the Duke of York made their memorable trip in the *Ophir*. After passing through these, which are exquisite examples of refined simplicity and perfect color-harmony, the visitor comes to the Morning Room, which is a simple model rendering of an old sixteenth-century style. A characteristic feature is the large stone fireplace. Over the high paneling on the walls there is a painted frieze of rich color, surmounted by a ceiling reproduced from a sixteenth-century house in London. The Billiard Room is in the Elizabethan style. Here, the features which at once strike one are the paneling of the walls, the severe plaster frieze, the roughly adzed oak beams

resting on stone corbles, a lantern light overhead and a picturesque ingle-nook on a raised platform. The plaster wall of the side recess is relieved by hangings of tapestry and other interesting objects. The carved oak settees in this room are exact copies of the beautiful originals in the South Kensington Museum.

An exhibit of this kind, so artistic and so practical, cannot fail to arouse a good deal of interest in the United States. It may be fairly described as a splendid suggestion for the furnishing and decoration of a rich man's house—that is, of a rich man who prefers good taste to opulent display, and artistic simplicity to lavish and obtrusive ornament. Any one who wants to see how the inside of a house can be made really beautiful cannot do better than visit this interesting and delightful collection of Decorative Interiors. The seventeenth and eighteenth centuries live again in them, but live influenced and modified by the utilitarian spirit of the Present. It is in the *ensemble*—in the admirable aggregation of superb artistic examples—that the great charm of the exhibit lies. You pass from the Elizabethan to the Georgian, from the Georgian to the Louis Seize, from the Louis Seize to the Sheraton, and so on, with a profound feeling that each is not only perfect in itself, but is the indisputable complement of the others. The distinguishing quality of each room is "charm." Messrs. Waring & Gillow have essayed to show us how convincing as arguments are simplicity and harmony exemplified in the hands of great and greatly experienced experts. The tendency, in these days of rapidly acquired wealth, has been too much the other way. The idea has been encouraged by a certain school of decorators that Art is of necessity a question of money, and that the more you spend the more artistic is the result. Here we have a crushing exposure of the folly of such a theory. Richness there is; a fine quality of judicious ornament, freedom of color where color is required; but everywhere there is restraint, the refinement that never palls, and the dignity of a fine simplicity

DRAWING-ROOM

THE ORGAN IN THE HOME

SET among the trees of the wooded portion of the World's Fair grounds are the State Buildings. The roads wind in and out around them, the flowers bloom, and the birds sing, giving the whole Plateau of States the air of a country-place with splendid suburban homes. There is nothing here to suggest the humming activities of the great Exposition that surrounds it. Here is the centre of the social life—in these hospitable State Buildings, friend meets friend, and people from all parts of the country come together.

The very centre of this social life is the beautiful New York State Building, designed by Clarence Luce. It seems as if it was built to serve as the executive mansion of a Colonial governor, and, indeed, it has been the gathering-place of many important assemblages.

Perhaps the most interested guests of this hospitable New York home are those who gather every afternoon to hear the Æolian Pipe-Organ concerts. From three to four o'clock, the handsome assembly-room and wide rotunda are filled with visitors from every State and from many nations, listening to the pure tones of the organ played by means of a roll of perforated paper.

This superb Æolian Pipe-Organ is placed on the east balcony of the rotunda, and in the assembly-room, nearly one hundred feet away, is the department which constitutes the Æolian Echo Organ, while cathedral chimes sound softly from still another distant part of the building—all three instruments being entirely under the control of the organist at the rotunda console and operated by him by means of the perforated roll. The main organ, the Echo Organ, or the chimes, however, can be played singly, if desired, and the usual console key-board, with electrical connections, allows all three instruments to be played by hand—separately or collectively.

The New York Building has become the rendezvous for the lovers of good music who visit the World's Fair, but it is doubtful if many of them realize that the great compositions are being played with mechanical aid. In fact, with the aid of the Æolienne, this instrument is able to produce tonal effects that would be impossible, owing to the limitations of human hands.

With a single music-roll, any one, even if unskilled in the use of musical instruments, can produce not only all the two-manual (solo and accompanimental) effects obtainable from an organ when played from the key-boards, but also many others, previously obtainable only from the grand orchestra.

It is owing to this, and through the artistic combination of organ building and organ playing, and because it is designed primarily for private residences—where the so-called church-organ is unsuitable—this new and highly developed type of organ is found in many of the representative homes in this country. In these respects, also, it is unique, as it occupies an entirely new place in the world of music.

Supplied with every tonal force and every power of expression required for the most artistic performance of the highest class of music, this instrument, whether played from the key-boards or from the Æolienne, is not only a grand organ, but it is truly a veritable orchestra—a constant source of education and intellectual enjoyment, both to performer and listeners.

The perfect adaptability to the decorative scheme of any fine house is shown by the admirable harmony of the Æolian Pipe-Organ at the New York State Building, with its surroundings. There, as elsewhere, this superb instrument has a positive decorative value and makes a distinct contribution to the ensemble, as shown in the illustration.

In this great Exposition, therefore, which typifies the progress of this enlightened century, the Æolian Pipe-Organ, in the New York State Building, forms an important part, since it stands for culture without drudgery, and the love of beauty without the wearisome effort that robs it of its joys.

This fine instrument has been installed by the Æolian Company, of New York, which has carried out commissions for the most discriminating lovers of music throughout the world.

THE AEOLIAN ORGAN IN THE NEW YORK STATE BUILDING

AN EXHIBIT BUILT OF MUSIC

NOT the least of the interesting things to be studied at the World's Fair at St. Louis is the music. From the rythmic beat of the brass gongs in the Igorot village, to the finished rendering of the works of the great masters on the grand organ in Festival Hall, and the discordant twanging of the Samisens in "Fair Japan" to the harmonies produced by the Exposition Orchestra, all varieties of music may be heard. Barbarian music may be studied at first hand, and instruments ordinarily seen only in museums may be seen in actual use, producing native melodies.

In the Palace of Liberal Arts, in the section devoted to modern musical instruments, is a veritable temple of music, inasmuch as it is actually built of harmonies transmitted into metal. The side walls and dome of The Regina Company's exhibit are sheathed in music that only needs the magic touch of the Regina to turn the discs into the chords and melodies composed by masters of every nation, ancient and modern.

If one has a liking for the quaint music of Japan, harmonized to occidental ears by Sir Arthur Sullivan, the Regina will play "Mikado," and lose nothing of its charm and beauty; if, on the other hand, one has a penchant for Hungarian, Irish, Scotch, Spanish, or even African harmonies, each and all can be heard at the steel-lined temple of music in the Palace of Liberal Arts. The Regina has no preferences, its taste is the taste of its owner, and its repertory is not confined to any nationality or class.

It is its adaptability to any mood that makes the Regina music-box such a delightful instrument (I was going to say companion), since it is only necessary to change one steel disc for another—an operation as easy as taking a book from a shelf—to change the sentiment of the harmony from sparkling to pensive or from a hymn tune to a waltz.

Nor is even this necessary, for by a clever contrivance operated by clockwork the Regina will play a predetermined selection of compositions without causing the least effort on the part of the hearer except to start the mechanism.

THE REGINA WITH AUTOMATIC TUNE-CHANGING DEVICE

This mechanism also is of special value to a hostess giving a dance, for instance, for the Regina can be depended upon to play a series of waltzes, or waltzes and two-steps alternately, in perfect time and with an unruffled good nature that never resents a call for an encore.

Among the instruments shown at the Regina temple of music is a clock of the tall grandfather pattern, which plays a short melody every half-hour—discs may be changed at will, so there need be none of that repetition that becomes so wearisome in time. Another Regina music-box is made in the form of a desk—is a desk, in fact—with drawers, comfortable broad writing-surface, and attractive appearance in keeping with a library, yet it is only necessary to lift the top to disclose the music-box and the rack of music discs, which is stowed in one of the pedestals.

Other Reginas are in the form of cabinets, that are more or less ornamented and made of various beautiful woods—the larger ones

REGINA
REGINA
MUSIC BOX CO.
CHICAGO NEW YORK
AFTER A RESTLESS, UNEASY, PEEVISH DAY, TRY A REGINA MUSIC BOX, ITS A MENTAL SOOTHING SYRUP. EASY PAYMENTS.

THE REGINA TEMPLE OF MUSIC IN THE LIBERAL ARTS BUILDING

have 172 tongues tuned in chromatic scale, embracing over seven octaves, all controlled by steel discs that never wear out, and are, therefore, always correct in performance.

One who visits The Regina Company's exhibit gets an idea of the vast resources the owner of their instrument has to draw upon. If one could possess a library which would respond instantly to a call for Shakespeare, Dickens, Emerson, or Mr. Dooley, so that the owner could sit in a comfortable easy-chair and hear the flowing sentences pronounced perfectly and with proper intonation as long as he wished, and then press a spring when he had enough of literature, he would have something that even American millionaires could not purchase. Yet the Regina makes it possible to do that very thing with the great musical compositions.

THE LIBRARY TABLE REGINA

Thousands upon thousands of melodies of all kinds have been permanently recorded on discs of steel that may be as easily filed as a sheet of paper or a thin pamphlet, and, whether the owner wishes to hear Wagner or Sousa, Neoni or Rubenstein, his particular taste can be gratified without any effort on his part.

It is the province of the charms of the music of the Regina not "to soothe the savage breast"—though it will do that, too—but to calm, enliven, stimulate or soothe the modern cultivated man and woman.

"A Harmony in Two Flats" is the title of a drawing love-story that also tells all about the Regina's. A note to 11 East 22d Street, New York, or 259 Wabash Avenue, Chicago, will bring one to you, postage paid, without delay.

GRAND OPERA AT THE FAIR

GREAT are the contrasts and even paradoxes afforded by a big exposition. But the unexpected becomes the amazing when you are invited to hear grand opera on the opposite side of the Plaza St. Louis, and are told that Tamagno, although thousands of miles away in Italy, will sing for you. Yet this is quite possible, for the Victor Talking Machine, at its exhibit in the Liberal Arts Building, brings many an operatic favorite within the hearing of thousands, who, wearied by a multitude of sights and sounds, find real rest and refreshment in beautiful music. To those persons whose only acquaintance with a talking machine conjures up an instrument combining the musical qualities of a megaphone and a jews-harp, the Victor with its Red Seal records is a genuine revelation.

Copyright, 1889, by J. B. Falk, N. Y.

COMM. FRANCESCO TAMAGNO, TENOR

The voice of Jenny Lind is to this generation nothing but a tradition, a legend of the past, which has more or less of illusion and romance, but nothing of reality. The fathers and mothers who listened spellbound to her matchless voice, as she sang in Castle Garden thirty years ago, can never quite convince their sceptical sons and daughters that she was superior or even equal to Melba. Who shall say with authority whether Campanini, king of tenors, or Caruso, idol of the last opera season, was the greater artist? Memory must be the only arbiter, by no means an infallible one or impartial. The controversy between the adherents of the glorious past and of the insistent present must continue indeterminate, there being no means of comparison available. But, other times, other manners; modern invention has supplied the means by which these golden voices may be preserved to delight thousands to come after them. The phonograph, once merely a crude, mechanical toy, which aroused wonder, but not admiration, has been perfected till, in the Victor Talking Machine, we seem no longer to have a piece of mechanism, but a person, or rather a group of persons, each a master of his art, devoting himself to our amusement and instruction.

By means of the latest improvement, shown in the company's exhibit, the tinny, mechanical sound noticeable in the earlier and inferior talking machines has been entirely eliminated, until there is no longer a hint of mechanism or of anything save the pure, untrammeled voice as it pours forth in wonderful purity and volume. So sensitive is the Victor, so perfectly adjusted to the human voice, that it seems like a wizard as it unerringly reproduces beautiful tones. The Red Seal records are attempts, and highly successful ones, to present the voice or the playing of some noted artist in such a way as to satisfy the critical and appreciative lover of music. As Calvé sings her Carmen, one instinctively looks toward the instrument, half expecting to see the Spanish coquette. When Tamagno's voice is heard, with wonderfully

realistic effect, in the dramatic Mort d'Otello, remorseful, despairing, you listen involuntarily for the thunderous applause which should follow.

Thus the great song-epics and the haunting tone-tragedies of the world's greatest composers pass into the delighted ear. It is no longer necessary to pay Parsifal prices for opera. The Victor Talking Machine brings it to your own home, where you can sit in ease and comfort, surrounded by friends, while the masters and mistresses of song entertain.

Indeed, the Victor Talking Machine has made possible a new and charming method of entertainment. Heretofore it was necessary to employ famous artists, at extravagantly high prices, for elaborate home musicales. The hostess paid merely for the lionizing of her star. The Victor Talking Machine musicales are the latest and most improved form of entertainment. Instead of one star, you get a whole constellation, and there is no limit to the encores. It dispels care, and makes pleasant the hot summer nights. The new summer maximum is—Given a front porch and a Victor Talking Machine, and you have resort and pleasure combined.

CAV. ENRICO CARUSO, TENOR

And not only is the human voice faithfully rendered, but instrumental music—violin solos by Kubelik, stirring marches by Sousa's band. The sensitiveness and accuracy of the Red Seal records are well illustrated by the following story of Madame Patti. Mr. Landon Ronald, the well-known composer, once took some Red Seal Records to Craig-y-nos for Mme. Patti to hear. After playing several selections, he turned about and, to his astonishment, found the great prima donna in tears. "I cannot help it," she said. "It seems as if all my old friends were gathered around me."

Incidents like this show the distinct *human value* of the Victor Talking Machine. The voices of the past are made to sound again, stroking the heart with tender memories.

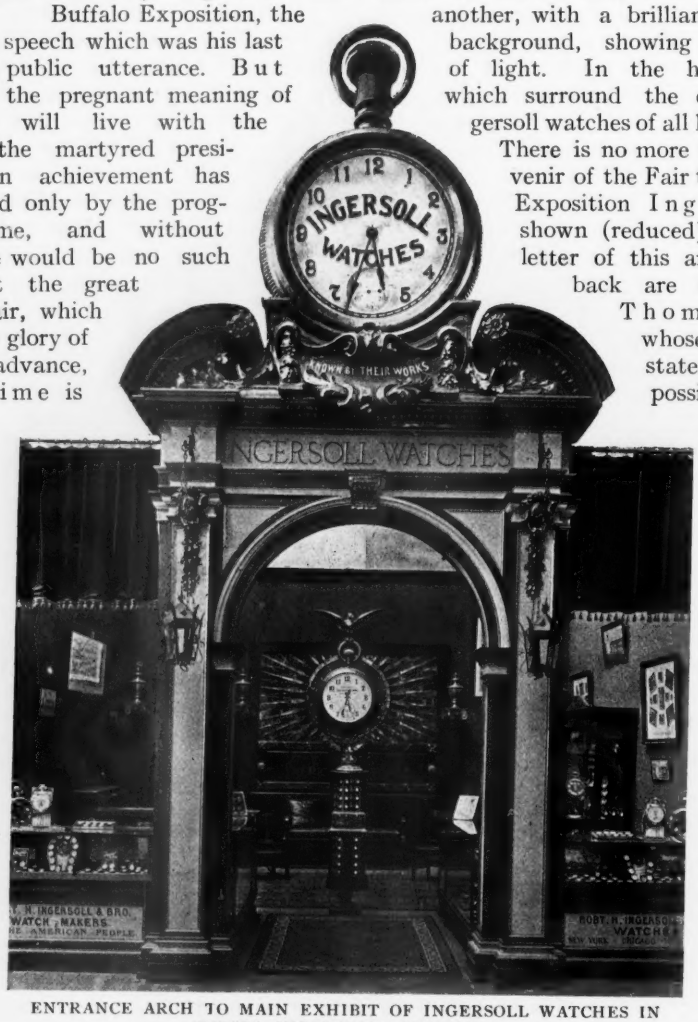
The whole world has a speaking acquaintance with the Victor Talking Machine. It draws no color-line, and it is neutral with all the nations. You may hear orators making impassioned pleas for the uplifting of the race along with the world's famous singers and musicians. These machines have made a girdle of recruits around the earth, leaving a tuneful memory in their wake. They delight the young and the old—always the very messengers of gladness.

The Victor Talking Machine's exhibit in the Liberal Arts Building comprises a large corner booth, done in the Moorish style, with massive canopy and pillars in cypress wood. Talking machines of various sizes and styles fill the glass cases surrounding the room, and a fine instrument gives frequent renditions of selections ranging from grand operas to rag-time, each style finding its admirers among the crowds attracted. The principal feature of the exhibit, and one of the most striking things in the whole Fair, is the life-sized gold dog at the front of the booth. This reproduction of the well-known trade-mark, "His Master's Voice," shows the familiar fox-terrier in his attitude of puzzled listening at the horn of the talking machine. This piece—the dog and the machine, both being of twenty-four karat gold—was executed by Messrs. Tiffany & Company, of New York, expressly for this exhibit.

THE TIMEKEEPERS OF PROGRESS

"EXPOSITIONS are the timekeepers of progress." With these impressive words, the lamented William McKinley began, at the Buffalo Exposition, the speech which was his last public utterance. But the pregnant meaning of these words will live with the memory of the martyred president. Human achievement has been measured only by the progress of time, and without watches there would be no such measure. At the great St. Louis Fair, which enshrines the glory of the world-advance, the official time is recorded by the Ingersoll mammoth watches—large models of the famous Ingersoll dollar watch—installed at the request of the Exposition management, and a striking tribute to American ingenuity and democracy, and to what might be termed our national watch. But this unfailing testimony, so to speak, to the Ingersoll timepiece is not the only evidence of their works at the great Exposition. In the Palace of Varied Industries, the Ingersoll watchmakers have a double-space exhibit, which, in detail and appointment, carries out the happy idea of the real economic worth of the watch in human progress. Over the entrance is a Yankee watch of heroic size, and just behind is another, with a brilliant stained-glass background, showing diffused rays of light. In the handsome cases which surround the exhibit are Ingersoll watches of all kinds and sizes.

There is no more interesting souvenir of the Fair than the special Exposition Ingersoll watch shown (reduced) in the initial letter of this article. On the back are relief-heads of Thomas Jefferson, whose genius of statesmanship made possible the Louisiana Purchase which the Fair commemorates, and of Napoleon Bonaparte, who consented to sell what is now the Empire of the Middle West. On the face of the watch is the beautiful picture, in colors, of the Cascade, the artistic outdoor triumph of the whole Exposition, and the waters fairly gleam in the sunlight, so vivid is the reproduction. On some of the watch-faces is the gayly colored Exposition flag, the symbol of a mighty American achievement.



ENTRANCE ARCH TO MAIN EXHIBIT OF INGERSOLL WATCHES IN VARIED INDUSTRIES BUILDING

The amazing thing is that, in the midst of all kinds of extortion and advance prices—the usual fair condition—the cost of these cheapest of all watches remains the same.

These souvenirs sell at $1.00 for key-wind models, $1.50 for a stem-wind-and-set model, and $2.00 for an especially elaborately finished one.

Besides the main exhibit, there are thirty attractive booths, in conspicuous places all over the grounds, where the popular souvenir Ingersoll watches may be bought.

There was a striking illustration, last year, in London, when Mr. Robert Ingersoll closed a contract for 2,000,000 dollar watches, the largest contract of the kind ever made. Those watches were exported to every part of the earth, taking from Europe a hitherto impregnable commercial field, and furnishing employment to thousands additional in America. In South African fields, the Kaffirs time their work by them; in the frozen stretches of the Canadian Northwest, the hardy trappers carry them under their furs; and, in the depths of the Ceylon forests, they repose under the spotless robes of the Singalese. Indeed, no watch has had such universal use.

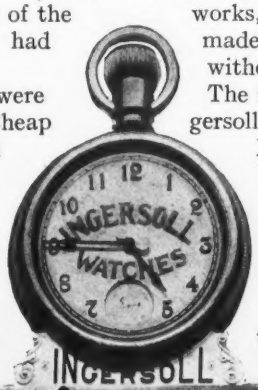
ONE OF THE THIRTY SELLING-BOOTHS

Twenty-five years ago, watches were the luxuries of the wealthy. Cheap watches were despised. Cheap in price meant cheap in quality, and a watch without accuracy is worse than no watch at all. The Ingersoll watch has so revolutionized the former idea of cheap watches that we hear no more about unreliability, and the old desire to avoid imparting the information that one was carrying a cheap watch is past. Ingersolls are now carried by representative people in every walk of life. Among those who have purchased them are such men as Mark Twain, J. Pierpont Morgan, and Thomas Edison. We today find the possessor of the Ingersoll watch only too glad to proclaim its merits on every hand.

The Ingersoll watch has really set the pace for the world in the watch industry, and leveled all classes in the matter of owning accurate timepieces. It is the watch of the millions and the millionaires.

It is more accurate than the peasant-made European watches, as the Ingersoll is made by the million by machinery. They are all alike, and all right. They do substantially the work of the $100 watch.

The Ingersoll watches are made at the largest watch-works in the world, located at Waterbury, Connecticut. The daily output is 8,000 timepieces. Every one of these watches is guaranteed. "Known by their works," is their motto. Defects are made good by a new watch, or repairs without charge.

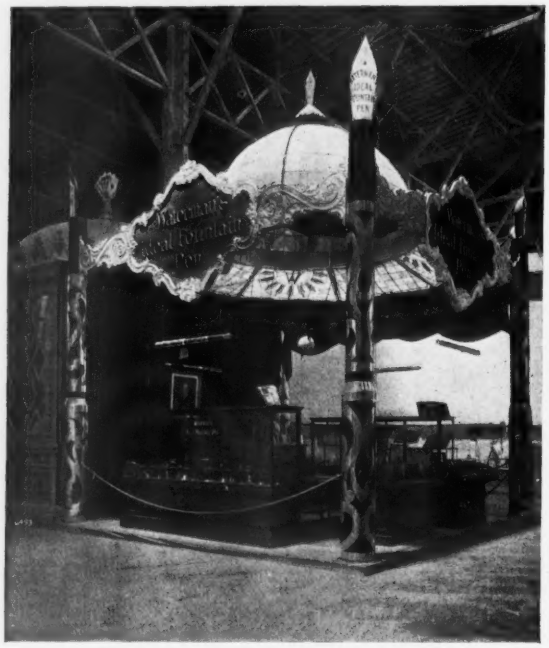


The manufacturers are Robert H. Ingersoll & Brother, 51-53 Maiden Lane, New York, with branches at Chicago, San Francisco and London, Eng. Those who do not visit the Fair may be glad to know that a souvenir Ingersoll can be had by mail by addressing Dept. 125, of the New York office of the manufacturers.

A MAMMOTH INGERSOLL WATCH OVER THE BALTIMORE & OHIO RAILROAD EXHIBIT IN TRANSPORTATION BUILDING

AT THE SHRINE OF THE DIPNOMORES

THE treaty ceding the Louisiana Purchase to the United States was signed by Robert R. Livingston and James Munroe, with pens made of quills. For that was one hundred years ago, and such a thing as a fountain pen had not even been thought of. This is one of the modern inventions so speedily adopted that it is already taken as a matter of course, and a man now carries a fountain pen as in olden times he carried a snuff-box, or, to come nearer our own days, a watch or a cigar-case. The fountain pen came only after a definite need had long been felt and various efforts made to supply it. People wanted a pen that carried its own fuel, so to speak, and was always ready for service, complete and independent in itself. The first attempts to fill this want were lame and unsuccessful; but those pioneer days are long past, and the Waterman Ideal Fountain Pen of today stands as a finished product, a delicate and yet sturdy piece of mechanism, ready for the daily round of business or social correspondence.



THE L. E. WATERMAN CO. PEN EXHIBIT

In the Varied Industries Building, corner C and 7th St., the exhibit of these pens has distinctive features. Four great filigree pens, twenty feet in height, act as pillars to support the dome of colored glass, on which is shown a map of the world. Depending from this dome is a large globe transfixed by a fountain pen—the L. E. Waterman Company trademark. The booth is handsomely fitted up with hangings of a rich, dark green, and mahogany desk and chairs. A large painting of Mr. L. E. Waterman, inventor of the pen, hangs in the rear of the room. Four pens, several feet in length, are suspended at the sides of the booth. Glass show-cases in front display the various styles of fountain pens, plain rubber, silver and gold mounted, varying in price from $2.50 to $100.00, the latter being set with diamonds. An impressive showing is made by the diplomas and medals exhibited, which have been obtained at the Expositions in Chicago, Paris, Buffalo, Atlanta, Omaha, Glasgow, and many other places. The L. E. Waterman Company exhibit in the Varied Industries Building has been named the Shrine of the Dipnomores, and a more cheerful, contented lot of pilgrims never seemed more at home or better satisfied with the object of their worship. In the centre of the "Shrine" is a table bearing a leather-bound blank-book of goodly size, where the cheerful pilgrims lay their offerings in the shape of testimonials about, and words of praise for, the Waterman Ideal Fountain Pen that has served them so well. This book is nearly full, so quickly have the "Dipnomores" registered their allegiance.

The willingness to subscribe to the benefits received by users of the Waterman Ideal Fountain Pen, even at the cost of considerable trouble, seems to be one of their characteristics, and speaks well for the trustworthiness

of the pen itself. In a recent testimonial prize contest, instituted by the L. E. Waterman Company, hundreds of testimonials were received from people engaged in all sorts of occupations. The winner, Mr. Arthur L. Stoll, of Los Angeles, California, who will enjoy a trip to the World's Fair at the expense of the L. E Waterman Co., secured a large and most interesting collection of letters, from a brief "O. K." of one Waterman Ideal user to a full description of its advantages by M. P. Snyder, the Mayor of Los Angeles. A remarkable feature of this collection is the wide range of occupations represented and the prominence of the contributors. All of these testimonials are interesting enough to print, as they show how Waterman's Ideal is adapted to every particular need; but space only permits the printing of a few:

CHICAGO, ILL., March 26, 1904.

DEAR SIR—

I have no objection to telling you the facts in regard to the Waterman Pen: For several years, in grinding out newspaper copy, I used a soft pencil and did not suppose that newspaper copy could be written with a pen, but one day I happened to get hold of a reliable fountain pen, and since then I have been a slave to the habit. I now have a battery of five pens, so that no matter how many I mislay, I shall always have one near at hand.

I am, with best wishes, Yours truly,

(Signed) GEORGE ADE.

EAST ORANGE, N. J., March 21, 1904.

DEAR SIR—

The Waterman Ideal Fountain Pen is the best of its kind I have ever used, as with it I am never tipping over the ink. Yours,

(Signed) HOMER DAVENPORT.

SANTA ANA, CAL., April 17, 1904.

DEAR SIR—

The Waterman Ideal Fountain Pen has been for the last year my faithful companion. The more I use it, the better I like it. Yours sincerely,

(Signed) HELENA MODJESKA.

Charles Major, author of "When Knighthood Was in Flower," writes this genial and emphatic note:

SHELBYVILLE, IND., March 23, 1904.

DEAR SIR—

I have never used any fountain pen other than the Waterman, and I am sure it cannot be improved upon in its line. It is very simple in construction, and like a kindly hearted woman, is always in good condition and helpful.

Very truly yours,

(Signed) CHARLES MAJOR.

Dr. Alexander J. McIvor-Tyndall, the well-known psychologist and lecturer, author of "The Power of Thought," contributes this splendid idea, happily appropriate to the nature of the writer's work and reputation:

DEAR SIR—

It is my conviction that the power of thought acting in accordance with the law of supply and demand created the Waterman Ideal Fountain Pen to meet the universal demand for perfection in this line. My own personal demand was supplied some three years ago by a beautiful silver-mounted specimen which is truly "*ideal*."

Yours sincerely,

(Signed) ALEXANDER J. MCIVOR-TYNDALL.

It is impossible to estimate how much work these pens accomplish in the world, or to state the part they play in finance, commerce, politics, education, or religion; but there is no doubt that the Waterman Ideal Fountain Pens go far toward making the work of the world easier.

L. E. Waterman Company, Home Office, 173 Broadway, New York.

European Office: 12 Golden Lane, London.

Branch Offices: 8 School Street, Boston, Mass.; 160 State Street, Chicago, Ills.; 138 Montgomery Street, San Francisco, Cal.; 107 St. James Street, Montreal, Can.

A BUSY CORNER IN THE L. E. WATERMAN COMPANY GOLD PEN FACTORY

A KEY TO THE WORLD OF MUSIC

WHEN the great organ in Festival Hall rolls out its sonorous notes, it is listened to with mingled emotions; some auditors are content to sit and drink in the music, absorbing it with a delight that is "akin to pain"; others enjoy quite as much, but are a little uneasy because they have no hand in it themselves. American music-lovers, therefore, are divided into these two classes—those who are satisfied to enjoy the playing of others, and those who wish to produce music themselves.

Messrs Roth & Engelhardt, who, for twenty years, have been manufacturing piano actions, have, as it were, turned over the keys to the public to the world's library of music by supplying a mechanism that enables the music-lovers to hear and produce music even if they have had no technical training. The Harmonist is the key, since it opens the storehouse of music to all.

ROTH & ENGELHARDT EXHIBIT

The Harmonist, through several very novel features, is suited to both the active and passive lover of music. This wonderful instrument is adapted to those who wish to produce music and to color a composition according to their own ideas, by means of a peculiarly sensative mechanism, operated by two levers, which control the length of a tone as well as its power; in other words, a sustaining lever is provided besides the usual tempo regulator. The loud and soft control is, of course, provided; by means of these three regulators.

To that other class of music-lovers who prefer to hear and enjoy without actually wishing to perform themselves, the Harmonist has proved a great source of pleasure. The Harmonist perforated music-rolls, of which there are thousands, including compositions of every kind, are prepared and edited by a musician of authority, and so cut that, if played properly, the expressions, the rises and falls in the strength of tone, the quickening and retards, will bring out the true meanings of the piece, just as if a master was playing it. In other words, the correct rendering of Harmonist music-rolls is in the rolls themselves, and it is only necessary for the passive lover of music to put the roll in the Harmonist, turn on the automatic expression attachment, and pump; and even this trouble may be saved, since one style of Harmonist is provided with an electric motor furnishing the power for pumping. The connection with an ordinary electric-light socket furnishing ample power. This style of player is equipped with the voluntary expression devices.

The Harmonist, being built by a firm having a long experience in the construction of piano actions, has a peculiarly sensitive touch; at once gentle and strong, it is really the only piano-player having full orchestral qualities, its pneumatics being so contrived as to sound the softest pianissimo, and of sufficient power to strike the entire sixty-six notes with considerable force.

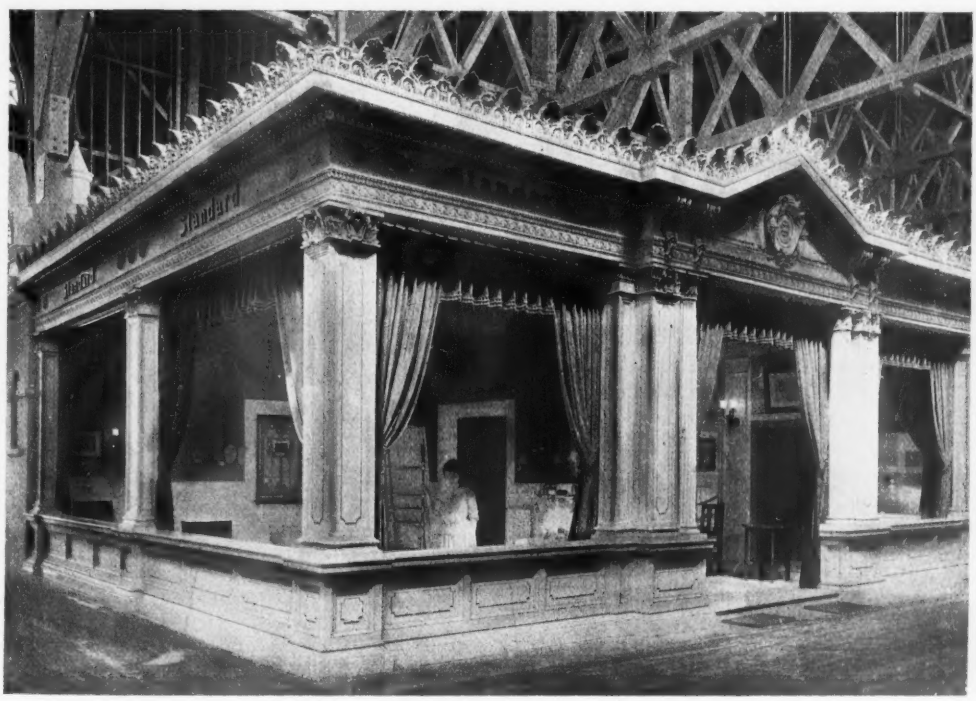
Beside the pedal-actuated and motor-driven Harmonists of different woods shown at the Roth & Engelhardt exhibit, in the Liberal Arts Building, their Peerless Automatic Piano and coin-operated Peerless Piano are also shown. These instruments are run by electricity and are controlled in the same way as the automatic expression Harmonists, but they have no voluntary expression mechanism. A piano action which received first award at the Pan-American Exposition is also shown, with some other pianos, on the other side of the aisle.

Messrs. Roth & Engelhardt's main office and warerooms are in the Windsor Arcade, New York.

THE BATH AS A MEASURE OF PROGRESS

FROM the old Roman bath at the Cluny, in Paris, to the glistening white porcelain enameled bath-rooms on view in the centre of the Manufacturers' Building is a long sweep of time, and even a longer sweep in progress. But both suggest the same thing — the bath as a source of health and power, for the bathing nations have been the conquering nations, whether Roman, Briton, or American. And some Pliny or John Fisk might write a whole history of progress, using cleanliness as a true measure of civilization. This would be especially gratifying to Americans, for no other people have done so much as they in perfecting all the accessories to the bath. How much has been done in this direction is shown in the elaborate exhibits of the Standard Sanitary Manufacturing Company, of Pittsburgh. If we are not the cleanest people in the world, as we are apt to pride ourselves on being, it is not because we have not been provided with every facility for cleanliness.

In looking over these bath-rooms, spick and span as a man-of-war's-man, one realizes why it is that the best houses in the world are equipped with the "Standard" products. Their key-note is healthfulness, the handmaid of cleanliness. Before aught else, they are sanitary, making of the bath-room what it should be in every house, a source of "sweetness and light." So superior was the "Standard" Ware, and so suggestive in its effects on the alert Japanese mind, that Baron Hirata, the vice-president of the International Exhibition at Osaka, in 1901, wrote to the Company, "We express our thanks for the valuable display of sanitary appliances, which proved to be a special object-lesson to our people." Not only to an awakening nation



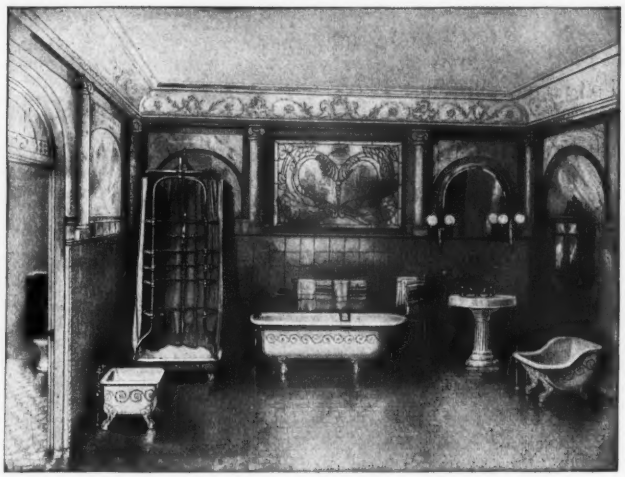
EXTERIOR VIEW OF "STANDARD" EXHIBIT—THE GREATEST DISPLAY OF THE KIND EVER MADE

THE LOBBY OF THE "STANDARD" EXHIBIT A MASTERPIECE OF ART

like Japan, but to England, which in the matter of the bath has always been supposed to be awakened, the ware of this company is considered the standard of merit. So, when King Edward, Lord Londonderry, Lord Leamington, or Mr. Wyndham, the Secretary of State for Ireland, want the most sanitary equipments possible for their residences, they commission the Standard Company to supply them.

In their exhibits at St. Louis there are shown the most attractive bath-rooms, at varying degrees of cost. That explains the great interest that has been taken in them from the opening day. People see, not unrelated pieces set about in dumb array, but actual bath-rooms, such as they have thought of and planned for. The price of the equipment of each bathroom is plainly stated, so one can figure on a room to fit his purse. In a word, it is an informing exhibit. For example, in bath-room number one you see the most elaborate equipment that can be made. In its centre is a porcelain-enameled pool bath sunk into the tiled floor, supplied with a needle-spray and shower—the most complete shower arrangement ever made. Here is all the luxury of cleanliness, such as Roman nobles never dreamed of. And it is quite within the reach of every well-to-do family in the country that cares to surround itself with the most essential comfort of any home. Besides the shower-pool, there are in this room a tub and sitz-bath of porcelain enamel, set into the floor on bases instead of on legs. There is a pair of scales so you can keep track of your weight, a mirror set into the wall and surrounded with a white tile frame, a separate room for closet, electric lights, art-glass windows, nickel-plated plumbing throughout, the tiled approaches to the room in old-ivory, draperies and decorations on walls, ceiling, and all the fixtures in a fine color harmony—everything suggestive of the luxury of cleanliness. No wonder that Madame Récamier felt that her bath was the source of her beauty, and that Bernhardt believes it the cause of her perennial youth. Ponce de Leon's fountain can be put into every home. This room number one has been duplicated in scores of the most luxurious and comfortable homes in the country.

AN ANTIQUATED PARISIAN BATH-WAGON—NOT AN UNCOMMON SIGHT ON THE STREETS OF SOME CONTINENTAL CITIES. THE AMERICAN "INVASION" OF "STANDARD" BATHS WILL SOON CAUSE THIS PRIMITIVE METHOD OF BATHING TO DISAPPEAR



THE LUXURY OF THE MODER N BATH-ROOM

If it seems more elaborate than one cares to put in, there is a room number two shown, that is a model of taste and convenience. In it are a combination shower and needle-spray on a receptor. Besides, there are a tub, sitz-bath, and lavatory, all of porcelain-enamel. On the wall is a medicine-chest with mirrored door, and there is a large oval mirror set in the wall. The floor is of snowy white tiling, and carried out on the walls and fixtures is a harmonious decoration scheme, with trailing wild roses as its distinctive note.

As the writer stood looking at this refreshing bath-room one morning, an Indian brave passed, in all the glory of feathers and paint, leading a little Indian girl. He looked over the marble sill of the "Standard's" house into the glistening room, and, in a heavy gutteral, came:

"Ugh!"

Thus the tepee saluted the bath-room, but the future may hold for the little maid, after she has been educated at Carlisle or Hampton, a home somewhere, with just such a bath-room, for civilization is on the march everywhere, and the bath-room is a most necessary part of its equipment.

The two rooms that have been described are on either side of a wide vestibule and facing the main aisle, but there are two more rooms in this home of cleanliness. In one of them is a third bath-room equipment, still more moderate in price than the other two, but it is neat and serviceable, with the apparatus of the highest sanitary quality, like all the "Standard" ware. There is a bath with a portable shower, a feature which the Standard has introduced widely. The price of this shower is but $15 complete, ready to install, and it is provided with the needle-spray just as the more expensive apparatus. There is a high tank-closet in this room, and a good lavatory, a mirror with white enameled frame, walls in blue with a glazed imitation of tiling part-way up, and ceiling in cream. It is an example of comfort and taste altogether out of proportion to the modest charge for providing it.

If there is anything you have missed in these three bath-rooms, you will find it in the fourth.

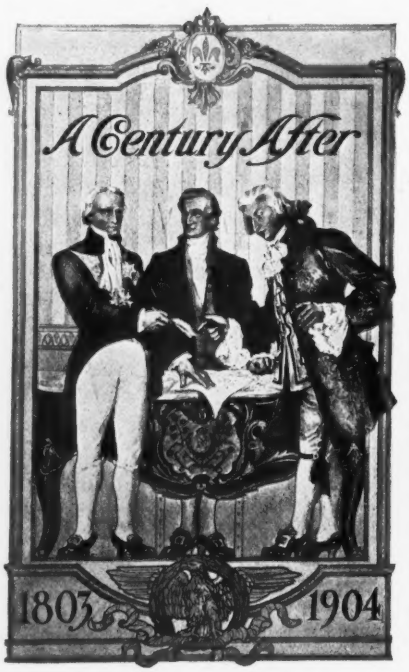
In this are grouped samples covering the wide range of "Standard" manufacture in sanitary appliances. There are laundry trays, a four-bowl centre barber or public toilet-room lavatory, a number of wall and corner single lavatories, a sanitary drinking-fountain for schools, different patterns of low-down and high closets, a one-piece kitchen sink with drip-board—all in the white beauty of porcelain-enamel. The tiling is white also, with a fleur-de-lis pattern, and the walls are tinted;

COMFORT AS AN AID TO CLEANLINESS

and on them are framed pictures, showing different bath-rooms that have been fitted up by the company.

Even the most cursory description of this exhibit must not overlook the exterior. It is of staff, in old-ivory, with white marble sills and base-boards. The front façade is finished at the top in shell-shaped scrolls, most attractive and artistic. Above the entrance, as a keystone to the arch, is the company's copyright design, in art glass, set in a scroll, and lighted by concealed electric bulbs.

In the broad lobby, with its mosaic floor, a very attractive decorative scheme has been carried out. An old-ivory finish gives its beautiful coloring to the doors opening into the bath-rooms on either side, and makes an artistic border for the two shades of green in the tilings on the side-walls. The woodwork is of weathered oak, and all is of craftsman design. On the walls hang the many awards which have been given the "Standard" in the past quarter-century. There are the highest awards received at Chicago, 1893; Omaha, 1898; Philadelphia Export Exposition, 1899; Paris, 1900; Buffalo, 1901; Charleston, 1902, and, at Osaka, Japan, 1903, the diploma, "Hors Concours" (beyond all competition). This progression of awards establishes the superiority of "Standard" ware from the highest of world authorities. It gives the place of unquestioned leadership in this whole field of manufacture to this great company, whose rise to industrial supremacy is one of the interesting chapters in American achievement. The Louisiana Purchase had been made, and nearly all of it had come into the Union as States, when the Standard Sanitary Manufacturing Company began its career a generation ago. Strong and sure has been the growth of the "Standard" from the beginning. It developed a great business on the broadest lines. The universal need of sanitary plumbing was clearly seen, and provision was made to meet it in the most thorough and scientific way. From the first, quality was the watchword. And the measure of this quality was healthfulness. Ware was made that gave to the essential sanitary side of plumbing an attention that it had never before had. This ware did the healthful work it was made to do. It banished the danger of sewer-gas from every home in which it was used. Cleanliness became a pleasure in the getting, instead of the cumbersome process of the past, or even of the present in some of the cities of Europe. Even in Paris, the "bath-cart man," peddling baths from house to house, can still be seen. These portable baths are delivered, and where there is no water-supply in the house the tub is filled from the tanks on the cart. But the "Standard" changed cleanliness from a Spartan virtue, to be gained after much effort, into one of the greatest pleasures of life. And the demand for its appliances grew at so swift a pace that only by the greatest effort could supply keep in hailing distance of demand. As a wise stimulus to demand, educational work through the printed page was begun and systematically followed. People were told the need of sanitary plumbing and the moderate cost at which it could be provided. They placed it in their homes or business houses and the resulting satisfaction made an army of enthusiastic friends. The Standard bath became the coveted model, known everywhere, and this progressive development has continued, until the Company today has great plants in Allegheny and New Brighton, Pa.; in Louisville, Ky., and two great works in Detroit, Mich., and has become the largest manufacturer of sanitary goods in the world.



COVER DESIGN OF THE "STANDARD" BOOKLET—THE MOST ARTISTIC SOUVENIER DISTRIBUTED AT THE WORLD'S FAIR

ELECTRICITY IN THE KITCHEN

PERHAPS the most striking thing about the Louisiana Purchase Exposition is the varied uses to which electricity is put.

It has been the pleasure of many visitors to the World's Fair to dine on the wide veranda of the New York State Building, and the enjoyment of their stay has been enhanced not a little by the delicious dishes served them by Mr. Bayno and his partner, the caterers there. The promptness with which it is served, and the exquisite quality of the food, however, are largely due to the electric range, invented by Mr. Bayno, with which the kitchen is equipped.

This novel use of electricity works admirably, as will be seen by the following menu and time-table. This menu was cooked by electricity at the New York State Building:

MENU

Caviar on Toast, Green Turtle Soup, Broiled Lobster, etc.

The time required to prepare dishes by the Bayno Electric Range is very short. A sirloin steak, for instance, is thoroughly cooked in six minutes, a chicken roasted in fourteen, a lobster broiled in twelve, a squab roasted in eight, etc.

There is, of course, no odor of fuel, and the red heat so necessary for the proper broiling that retains all the juices is secured in a few seconds after the current is turned on. A series of coils of wire over the oven serves to heat the top of the range, and at the same time, with another series under the oven, does the baking. Broiling may be done from the top, or in a special broiler in which the gridiron is placed in a special receptacle, both sides of which are lined with resistance-coils, which get red-hot and cook each side of the steak at once, searing the surface instantly, so that all the juices are retained.

The Bayno Electric Ranges are made in several sizes, for household use or for the galleys of yachts. This range is fully covered by broad patents. Although a recent invention, it has been successfully used at several of New York's leading clubs, having superseded the larger, more cumbersome and more expensive gas-stoves.

Proprietors of hotels, apartment-houses, clubs, restaurants, yachts, commissary officers of steamships and railroads, also stockholders of electric-power companies are requested to call or send representatives to see this electric range in operation daily at the New York State Building, during the World's Fair.

The patentee and owner, Mr. Maurice Bayno, will dispose of an interest in the patents, or will sell outright for a suitable compensation. The opportunity for profitable investment is in every way unusual.

THE BAYNO ELECTRIC RANGE AND ITS INVENTOR

Mr. Maurice Bayno can be addressed care of New York State Building, World's Fair, St. Louis, Missouri, or Shippers' and Travelers' Exchange, Lemp Building, First Avenue and 26th Street, New York.

LOTUS LODGE

A NEW IDEA FOR THE MODERN HOME

THE evolution of the home—its construction and ornamentation—has been very rapid from the days of Abraham, when men lived in the open, shielded from the weather by tents made of goat-skins, to the present time, when people seem to prefer the dirt and dust of large cities with the consequent inconvenience and unhealthfulness of tenement and flat-house living. The germ theory, while it does not seem to intimidate the city dweller, has, nevertheless, served to make him more careful regarding his manner of living, as he does seem to pay some little attention to what he eats and drinks and to the sort of atmosphere he breathes. In fact, the sanitary features of the modern home are becoming a question of vital importance. The question, as a whole, is one of the latest phases in the progress of civilization. The manufacturers of materials entering into the construction of the American home are constantly endeavoring to give the architect something better, less expensive, and more durable and sanitary. This rule holds good even to the ornamentation of a house. There is a demand, not only for a durable, a handsome, and an inexpensive wall, but also a cleanly wall.

Lotus Lodge, located in the Palace of Varied Industries, is a summer cottage, large enough for living purposes. This unique and handsome little house was constructed as a demonstration of all that is best in modern home-making, and to illustrate the use, in a comfortable and practical house, of Leatherole, manufactured by The Leatherole Company, 142 West 23d Street, New York; and Sanitas, the washable wall covering, manufactured by the Standard Table Oil-cloth Company, 320 Broadway, New York.

Leatherole is an embossed-cloth mural decoration, hand decorated, and very handsome, both in designs and colors. Its ornament varies through a range of more than three hundred styles, in high and low relief, imitation of tooled-leathers, tiles, and every decoration suitable for any kind of a room, from a hotel café to the sitting-room of a simple home.

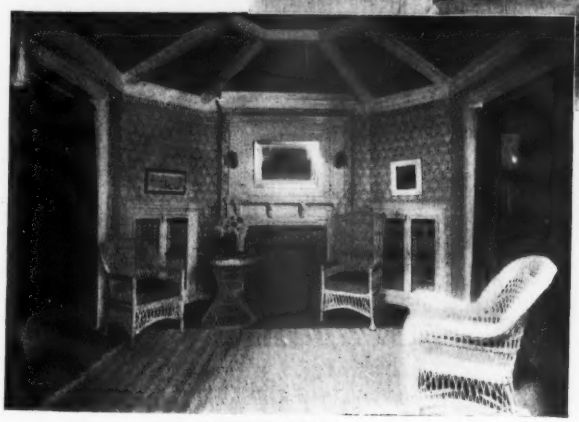
Sanitas is a light-weight oil-cloth, manu-

factured for covering walls. It is made in tiles, plain colors, and printed effects in dull and glazed finish. In Lotus Lodge there are on exhibition more than a hundred styles in Sanitas, suitable for any wall of the average home, from kitchen to parlor. Leatherole and Sanitas are waterproof, decorated in oil-colors which will not fade, hide all cracks in the wall, and are strictly sanitary in every respect. They are applied to the wall the same as paper, and, on account of the oil decoration and waterproof qualities of the material, they may be wiped off and kept free from dirt and grease.

The exterior of LotusLodge,shown by the illustration, is of the Italian Renaissance style of architecture. Plaster stucco forms its outside walls—gray, with a stenciled border in harmonious tints. The cove is richly colored and ornamented with plaster medallions, having for their motive the lotus flower. The roof is of Llodowici Tiling, gray and green, and extremely decorative. The entrance to the house, as shown by the illustration, is a semi-circular loggia, surmounted by a wrought-iron grille and a lantern of leaded glass, both from the Tiffany Studios. The den in this model cottage is devoted in part to the uses of a sample-room, where other products of the Standard Company are on exhibition. The living-room of Lotus Lodge, as shown by the illustration, opens out of the Leatherole office. It is done in yellow and blue, and on its walls is a neat little sea-shell pattern in Leatherole, in yellow and white. The ceiling panels are covered with Sanitas in yellow. The woodwork is white enameled, and it is here that the utilitarian aspect of Leatherole is clearly demonstrated; for, though this is the most used room in the house, its walls may at all times be kept perfectly clean. Lotus Lodge is one of the most artistic and unique exhibits at the World's Fair, and the washable-wall idea it exemplifies appeals at once to its thousands of visitors.

DEN

ENTRANCE



LIVING-ROOM

EXHIBIT OF OPTICAL GLASS ILLUMINATING APPLIANCES FOR ARTIFICIAL LIGHTS MANUFACTURED BY THE HOLOPHANE GLASS COMPANY, NEW YORK

SCIENTIFIC LIGHTING

ARTIFICIAL light is the first necessity of civilized life, but the best method of utilizing modern high-power lights has remained neglected until the Holophane system placed all such lights under absolute control. The tendency in the manufacture of glass globes heretofore has been entirely toward decorative effect and shading the light, and no attempt has been made to soften the light scientifically, nor to so control the direction of the light rays as to increase efficient illumination. All globes previously made merely shade and soften the light, by dulling and wasting it. The Holophane globes and reflectors, however, consist of a system of prisms, interior and exterior, scientifically constructed, by means of which the rays of light are broken up and scattered, or diffused, so that, while increasing the illuminating efficiency, the rays are softened and rendered harmless and agreeable to the eyes. The manufacture of Holophane globes is based on the scientific application of optical laws, and their use enables one to secure much better illumination from a light than is obtainable by any other glass globe, and to distribute that illumination where most needed.

This company has always obtained the highest awards at all International Expositions, and their glassware has the highest indorsements from the best-known light experts of the United States and Europe. No other manufacturer of glassware for artificial lighting has ever received any awards or any scientific indorsement.

The John Scott Medal, given every year by the Franklin Institute, of Philadelphia, for the greatest invention of the year, was awarded to the Holophane system.

The Holophane Glass Company is now known all over the world as the only manufacturers of scientific optical glass illuminating appliances for artificial lights.

LIGHTED BY HOLOPHANE GLASS GLOBES LIGHTED BY ORDINARY GLASS GLOBES

Both sides have the same number of lights and use the same amount of electricity

HOLOPHANE SYSTEM OF ILLUMINATION

THE illustration above shows a room at the St. Louis Exposition fitted up to demonstrate the high illuminating efficiency of Holophane Glass Globes, as compared with all other glass globes now in use. A curtain divides the room into two halves, which contain an equal number of lights of equal power. The results in illumination of these two different sections clearly prove that Holophane Glass Globes have a far greater illuminating efficiency than any other glass globes on the market, and also show the great economy of their use—a greatly increased illumination, at no extra cost, or an equally good illumination at much less cost.

The Holophane system of illumination utilizes to the utmost every ray that comes from an artificial light — absolutely no light is wasted, the upward and horizontal rays being deflected downward and thrown in useful directions, softened and diffused.

Holophane Globes are made in three different classes, each class distributing the maximum amount of light rays within different angles. By making these globes of different sizes and shapes, and of different classes of light distribution, the Holophane Company is able to meet all the varying requirements of artificial illumination, and can always guarantee much more efficient lighting results than can be obtained from any other globes.

Tests made by the General Electric Company, the Welsbach Company, and other large lighting companies have proved that Holophane Globes and Reflectors possess higher total illuminating efficiency than any other globes; and hundreds of thousands of Holophane Globes and Reflectors are used by these companies every year.

THE FINE EXHIBIT OF ED. PINAUD

NAPOLEON-MARIE LOUISE PERFUMERY

NAPOLEON'S RAZOR

LOOKING over the many interesting exhibits from the standpoint of historical suggestion or significance, nothing will be found between the Government Building and the Philippines' Reservation more appropriate to the historical meaning of the Fair than the exhibit of the PARFUMERIE, ED. PINAUD, of Paris. It is in the place of honor at the corner of the French Section in the Liberal Arts Building. Above it is the tricolor of France, and adorning its interior are the gold and white of the first empire.

The coronation of the Empress of France took place just after the Louisiana Purchase was made, and, in commemoration of that great historical event, the perfumer, Ed. Pinaud, has caused to be placed before the American public the gem of his valuable art collection, consisting of the faithful reproduction in wax figures of the coronation scene. This work of art was presented by J. I. B. Sabey to Napoleon the First, to show him the actual picture and the pomp of the ceremonies. It is displayed in a large, richly decorated glass case, which is both the centre of the exhibit and the centre of interest. The original painting, from which this work has been copied in all the finery of the period, is now in the museum of the Louvre. Near-by on an easel is a reproduction of the painting by Vibert, showing Napoleon and his consort having the mimic array of figures passed before them in rehearsal for the coronation. The picture, with the dainty wax model of the original figures, lends a special historical interest to this exhibit. This interest is enhanced by the scheme of decoration which is strictly in "first empire style." The carpet, with its figures and color, the glass cases, all the furnishings, the walls, in white bearing embossed figures in gold, are in the best spirit of the Napoleonic period. And surely nothing could be more fitting. In a way, this great Exposition is a Napoleonic commemoration, celebrating, as it does, the centenary of the Louisiana Purchase.

THE "CORONATION" CASE

Of course this historical and artistic scheme of decoration is intended to serve a double purpose. It is suggestive and fitting in the highest degree, and it gives a beautiful setting for the famous products of the house of Ed. Pinaud. On the Coronation stand, below the reproduction already described, there are two other glass stands on which are grouped an elaborate array of toilet articles of the first empire, including *Napoleon's own razor*, with mother-of-pearl handle and the imperial crest inlaid in gold. And below these historical collections is the perfume of the period, that was specially made for Marie Louise herself, reproduced perfectly in fragrance and quality from the original formula. There is a complete line of "Marie Louise" perfumery, including perfume, cologne, toilet water, powder, toilet soap. To the right of the Coronation stand is a marble fountain, spraying the deliciously refreshing "Marie Louise" essence.

At each of the four corners of the Exhibit, with the Coronation stand as the centre piece, is another large glass case on a stand, containing other special toilet preparations made by Ed. Pinaud. In the case, at the conspicuous corner on the main aisle, are shown some of Ed. Pinaud's leading perfumes. There are

the "Brise Embaumée Violette," the finest violet perfume ever made, and so near in fragrance to the odor of the living flower that they cannot be told apart. The "Bouquet La Foscarina," a dry and dainty perfume, always conceded the place of highest excellence; the Roman; the Madame Royale; and the Genet d'Or, a perfume very popular in Europe. In the second case on the main aisle may be seen toilet articles, such as Ed. Pinaud's Eau de Quinine, the most celebrated preparation in the world for the hair, the sale of which in this country alone has reached the great total of 150,000 bottles a month. Then there is a full display of the famous toilet water, Extrait Vegetal Lilas de France, of which it has been truly said that one drop is equal to a bunch of fresh lilac blossoms. In the third case, the preparations for the gentleman's toilet table are shown —the world-famous Brillantine, the shaving-creams and powders, the lavender waters, the cosmetics, the dentifrice elixir, etc., while in the fourth are the Royal Perfumes, the Violette Reine, the Violette de Parme, named from Parma in Italy, the birthplace of this violet.

After seeing this exquisite exhibit, showing the broad range of Ed. Pinaud's manufacture, and hearing the words of praise from visitors from all parts of the world, one readily perceives why it was that, at the Paris Exposition of 1900, Mr. Victor Klotz, the proprietor and manufacturer of Ed. Pinaud's perfumes, was honored with the distinction, "Hors Concours" (above competition), and made a member of the jury of awards. This is the world's highest commercial honor, and it was bestowed by the Universal Exposition in France, where perfume was first made, and where its highest development has always been maintained. In a panel on the interior of the exhibit is a list of the highest awards that have been given to the house of Ed. Pinaud. At Paris in 1855, 1867, 1878, 1889; at London in 1854 and 1862; at Vienna, 1873; Santiago, 1875; Amsterdam, 1883; Brussels, 1897; Glasgow, 1901; and the "Hors Concours," Paris, 1900.

The house of Ed. Pinaud has had a wonderful development along the broadest international lines during the three generations since its founding. It now has branch houses in every important nation in the civilized world, such as the American Branch, in charge of Mr. Emile Utard, in the fine Ed. Pinaud Building at 84–90 Fifth Avenue, New York city. The home offices are in the Ed. Pinaud Building, on the Place Vendôme, in Paris, facing the great monument which Napoleon erected from captured cannon, in celebration of his victories.

But, in a large way, the real exhibit of Ed. Pinaud is not the great house in Paris, nor its works at Pantin, nor its important branches scattered over the globe, nor, indeed, its artistic exhibit at St. Louis; but rather the enduring fame which Ed. Pinaud has won, among the discriminating people of every country, as the maker of the best perfumes in the world. Before that great jury of enlightened sentiment, he has been, for many years, "Hors Concours." Thus both in Paris and at the great Exposition in St. Louis the house of Ed. Pinaud is brought into association with Napoleon.

SALESROOM OF THE "PARFUMERIE ED. PINAUD" IN PARIS

FRENCH JEWELS THAT RIVAL THE WORLD

AMERICANS, in their enthusiasm for the productions of the artists and manufacturers of their own country, are apt to disregard the beautiful and useful things made abroad.

At the World's Fair, ample opportunity may be had to compare the artistic and practical things produced in other countries with those supplied by our own artists and manufacturers.

The Palace of Manufactures is a particularly good place to study the comparative beauty of foreign and native productions.

The exhibit of Henry Frères et Cie, of Paris, successors to Boin-Taburet, in this building, is particularly worthy of study. Here, in a graceful pavilion, are assembled some of the most beautiful silver-gilt, silver, cut-glass, and gold combined with enamel ever seen in this country.

EXHIBIT OF FRENCH JEWELS

In the centre is a high table, on which rests a reproduction of the Garden of Versailles, made of silver, gold-plated, and agate—the columns surrounding the miniature pavilion being made of agate.

In cases surrounding the central space are several toilet-sets in silver-gilt, and silver, after the style of Louis XVI., and one of blue cut-glass, and with gold engraving and gold mounting in the Empire style.

A copy of table service in present use by the King of Portugal is shown, and many table decorations, centre-pieces, and candelabra in the style of Louis XVI., are also exhibited.

The most interesting exhibits of this famous house of jewelers and dealers in rare curiosities is a collection of antique gold-boxes, which is the rarest, most complete, and valuable in the world. It consists of twelve boxes and a miniature painted on ivory, mounted in silver and studded with diamonds. These boxes have a personal interest aside from their intrinsic value. One of them is in the Japanese style, being made of gold, inlaid with pearl and enamel, and was ordered from a French jeweler by Louis XVI., after French mariners had returned from Japan, bringing with them objects of art from that country. Another particularly interesting box is also of gold, round in shape, and decorated with painted figures, vines, and flowers, and covered with a peculiar varnish, which imparts a beautiful luminous amber tone—this is known as Varnish Martin, and the secret of its composition died with the inventor.

Others of the boxes are decorated with enamel having charming miniatures incorporated, some are studded with diamonds, pearls, and other precious stones—all are of gold, and all are beautiful. All are rare, being the only ones of their kind in existence, and all are old, having been made two hundred to two hundred and fifty years ago.

The exhibit of Boin-Taburet, Henry Frères et Cie, is group 30, in the Palace of Manufactures, and is attracting the attention of the most discriminating people who visit the Fair. Their Paris address is 3 Rue Pasquier, 3.

THE HAYNES-APPERSON EXHIBIT IN THE TRANSPORTATION BUILDING

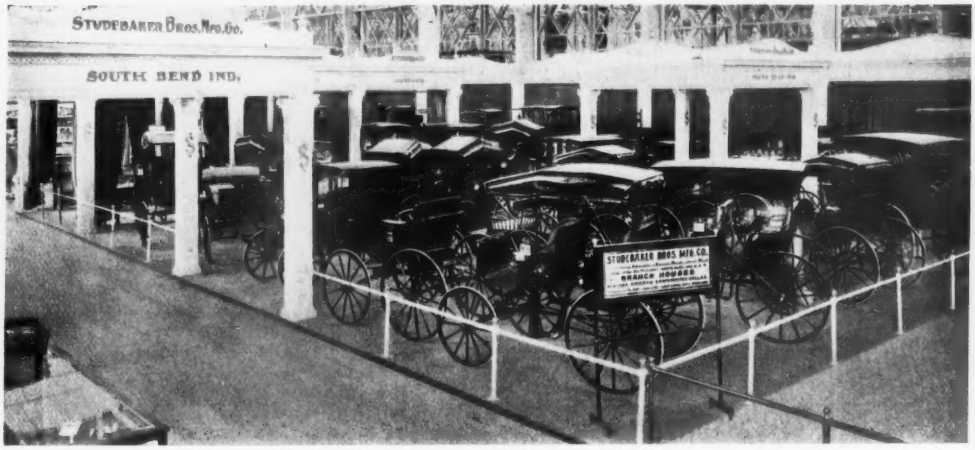
AUTOMOBILE PROGRESS FOR TEN YEARS

THE longest stretch of progress between the World's Fair at Chicago and this one at St. Louis is unquestionably that covered by the automobile. Comparisons here are so startling that they become contrasts. For example, in the Haynes-Apperson exhibit, in the Transportation Building, there is shown the first gasolene car made and successfully operated in America. It was built by this company in 1894, the year following the Chicago Fair, and although it ran and illustrated a principle of power of the greatest importance, it looks to be separated a generation from the beautiful Haynes cars of 1904. In ten years, this company, which is the oldest automobile manufacturer in America, has brought the automobile to a point of great efficiency and unusual attractiveness.

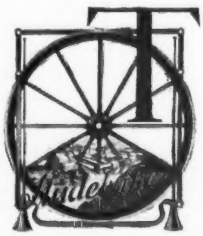
There are four automobiles in the exhibit—three besides the pioneer gasolene car. Two of these are the two-passenger touring-cars and one the tonneau, whose fine artistic lines and beautiful finish, together with the acknowledged mechanical excellencies of the Haynes car, have made it one of the chief features in the entire automobile section. The two-passenger cars are conceded to be the strongest and swiftest of that type that are made either in this country or abroad. The engine in both cars is the opposed-cylinder balanced type, which this company originated and developed with such success as to invite the indorsement of wide imitation. It is the only engine free from vibration that is also simple and accessible in all its parts. From the first, the Haynes car has proved that it could be depended on in all sorts of emergencies. In every official endurance trial, it has met the most trying conditions with success, even to running on railway ties and through water over the wheels of the car. The list of Haynes-Apperson's seventeen first awards in long-distance tests is not even approached by any American or foreign automobile,

In brief, Mr. Haynes *originated* the following essentials of all automobiles: Electric ignition, magneto-generators, make-and-break spark, throttle control, double-cylinder opposed balanced motor, aluminum composition in gasolene-engine construction, the only change-speed gear in the world that has been perfectly satisfactory for years and that does not require improvement. All of these have been widely copied, except the transmission, which is fully patented, and is not only the most perfect known, but is found only in Haynes cars.

THE STUDEBAKER CARRIAGE EXHIBITS IN THE TRANSPORTATION BUILDING



VEHICLE MAKERS FOR THE WORLD

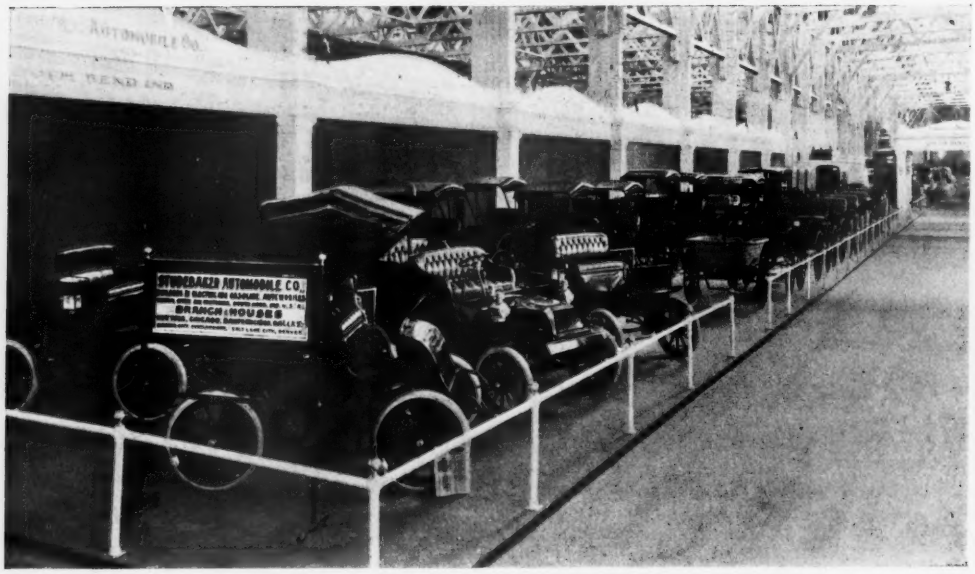


THE bullock-wagon of Egypt, whose cumbersome wheels still crunch the sand of the roads along the Nile, is in one corner of the Palace of Transportation, and on the opposite side of the great stretch of floor, under a big American flag, is the Studebaker vehicle in its scores of forms. Thus, in a walk of two minutes, one can cover thirty centuries, and bear the greeting of the Sphinx to the Flag and all it stands for in industry and achievement. For industry and achievement in America are but the commercial expression of freedom, the hammering out, with the free arm, of the ideas that take shape in the free man.

And these great Studebaker exhibits, covering nearly 10,000 square feet, are deeply impressive embodiments of the free industrial spirit of the country. Moreover, they are very interesting in themselves. But behind them loom the great factories at South Bend and the fifty-two years of cumulative growth, from a little blacksmith shop, with a yearly product of two wagons, to the place of conceded leadership in the vehicle industry of the world. This is progress that is typically American. It is the sort of progress that has changed the great valley of the Mississippi, in a century, from a wilderness into the mightiest industrial empire of the ages. Mankind can point to no achievement comparable to this transformation in all its long march from the Stone Age until now. And, of this achievement, the World's Fair at St. Louis is the impressive commemoration.

To have been a part of the last half-century in this wonderful transformation is the distinction of the Studebakers. That is their real exhibit—it is the country whose cities they have helped to build, whose farms and mines they have aided greatly in developing. Many of the prairie schooners that sailed across the plains in the fifties were Studebaker wagons. The roads into the far Northwest followed trails that had been broken by Studebakers. In the fat valleys of the Miami, the Illinois, the Missouri—all over the broad West, they bore the loads.

And when the farmer or the business man had reached the point where he wanted a carriage for his family, the Studebakers were ready to supply him, as they were later with an automobile. And the skill they had acquired in making wagons they employed and developed in building carriages, until their vehicles have come to be accepted in every part of the world as the standard of excellence. There are shown in their exhibits at the Fair types of seventy-five vehicles, such as broughams, victorias, depot-wagons,



THE AUTOMOBILE EXHIBITS OF THE STUDEBAKER AUTOMOBILE CO.

coupé rockaways, opera-busses, phaëtons, top-buggies, road-wagons, runabouts, extension and canopy-top surreys, electric and gasolene automobiles, farm-wagons, dump-wagons, coal-wagons, ice-wagons, express and truck-wagons, merchants' delivery-wagons, sheep-camp and mountain wagons; and there is, besides, a splendidly equipped harness and stable accessory department. This contains about one hundred sets, of different styles and grades, of four-in-hand, tandem, double and single brougham, double and single road-harness, surrey-harness, and, in fact, almost all kinds of harness for pleasure and teaming purposes. There is a line of riding-saddles shown which are made not only from an artistic point of view, but for comfort. In stable furnishings there are blankets, suits, brushes, whips, coachman-suits, lunch-baskets, dash-clocks, lamps, road-kits—in fact, the visitor will be amazed at the wide variety included in these great Studebaker exhibits.

There is again shown, as at Chicago, the beautiful wagon made of aluminum and rosewood. Imbedded in its sides are all the medals that have been awarded the Studebakers in a half-century. The accompanying illustrations will show how attractively the exhibits have been arranged.

Visitors often express surprise at the great amount of space occupied by the Studebakers, who, with Westinghouse and the American Locomotive Company, are the largest exhibitors at the Fair. But, if they look up, they will see the answer in a broad stretch of canvas, bearing a picture of the great plant at South Bend, which covers more than one hundred acres. The product of this plant fills a train-load of freight-cars every working day. In marketing it, there are five thousand dealers, in all parts of the United States, besides trade representatives in every section of the world, and there are great Studebaker repositories in Chicago, New York City, San Francisco, Portland (Oregon), Kansas City, Salt Lake City, Denver, and Dallas. Surely, the blacksmith-shop of fifty years ago was an acorn from which has come a spreading oak of trade and industry. And that simile really suggests the manner of the Studebaker growth. It has been like a tree. Each year there has been added a widening ring of accomplishment. And like a tree, the great business has grown from within. There has been no compelling hand from without, grasping widely scattered factories and bringing them into a giant consolidation, as has been true in many industries; but, nurtured by the sap of its own strong life, it has become a business oak, strong through and through.

This unfolding of a great industry, following a law of nature, is full of suggestion and hope. It shows the sufficiency of a business organiza-

THE FOUNDERS AND PRESENT MEMBERS OF THE STUDEBAKER BROTHERS MANUFACTURING COMPANY, THE LARGEST VEHICLE MAKERS IN THE WORLD

tion, if it have adaptability and foresight in its management, to adjust itself to changing conditions. Stress of circumstance may press hard from without, but it can be withstood

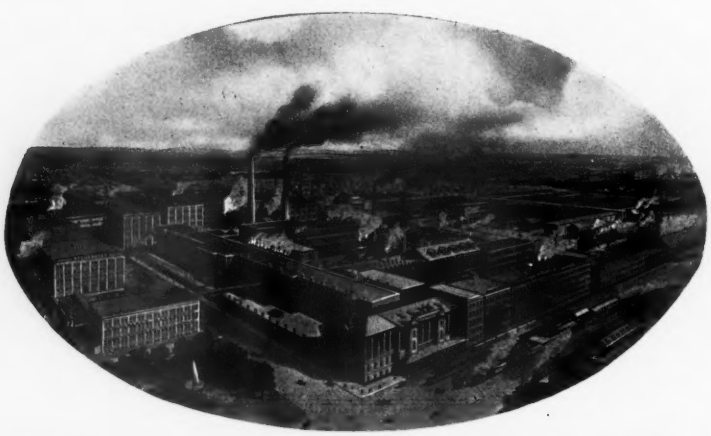
WHERE THE GREAT BUSINESS STARTED

and overcome if there is the right sort of strength within. This inner strength has been the inheritance of the Studebakers. It has come down to them from a long line of ancestors, and it has increased as it has descended. It has found expression in a distinct standard of workmanship—everything must be built from within. There must be soundness in axle and spoke and gear, in tire and tongue and body—then there can be paint on the outside, and the shield added of a great name—Studebaker.

Strength of this sort has been built into the Studebaker vehicles, and given them an enduring reputation in all parts of the world. If the United States Government wants a train-load of ammunition wagons and ambulances to be sent immediately to China, as at the time of the Boxer uprising or the Cuban war, the order is placed with the Studebakers, and, in less time than it formerly took to build one wagon, a train-load starts for its destination. In six wars, beginning with the Civil War, the Studebaker has been the important factor in doing the work of transportation. And in the stress of war, as in peace, it has always been strong through and through, ready for every emergency.

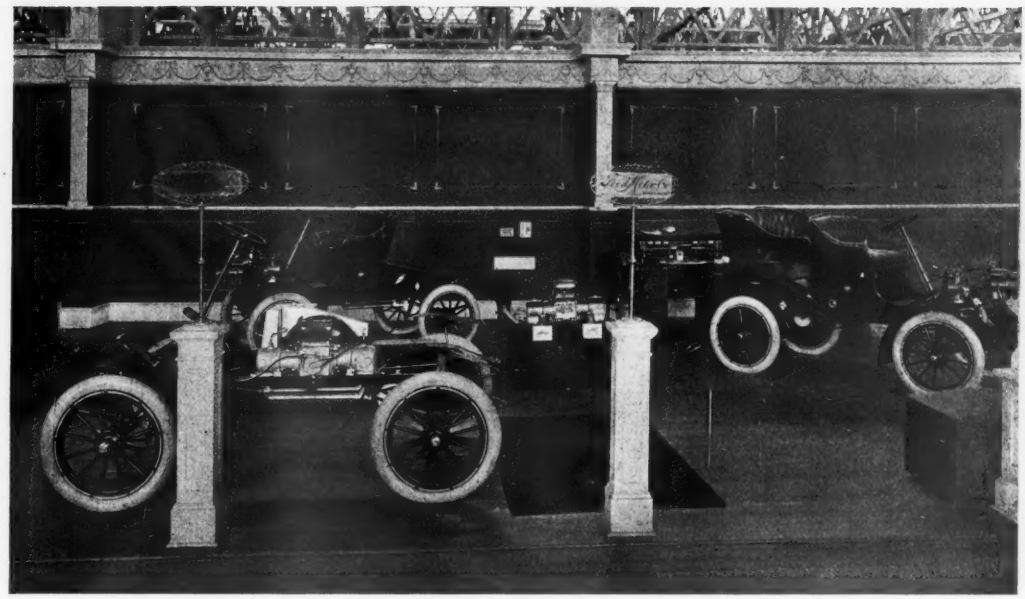
If the President of the United States, as President Roosevelt and others before him have done, wants a luxurious brougham, a victoria, a family carriage, or a vehicle of any kind, harness or stable accessories, an order sent to the Studebakers at New York, Chicago, or at any one of their various repositories, will be instantly filled to the complete satisfaction of the customer.

In the second half-century, the Studebaker Brothers Manufacturing Company will keep in alignment with new conditions, but always, one may be sure, from the solid foundation of the changeless principles that have been followed from the beginning. There will be progress, but it will be always the substantial kind that comes by growing from within. With abundant capital, providing every facility; with fixed principles, finding expression in the highest standard of workmanship, the Studebaker Brothers Manufacturing Company may well hope to maintain their conceded position as the greatest vehicle manufacturers in the world.



THE PRESENT PLANT AT SOUTH BEND, COVERING 101 ACRES

THE AUTOMOBILE EXHIBIT OF THE FORD MOTOR COMPANY



THE MOTOR-CAR OF SATISFACTION

LIKE the other great exhibition buildings of the Fair at St. Louis, the space within the Transportation Building is divided between the American and foreign exhibitors. It is very interesting to compare the product of the French automobile builders, who admissibly first perfected the power vehicle, with the American motor-cars on the other side of the great structure. Though the foreigners had the advantage of longer experience and earlier encouragement, with the additional incentive of magnificent roads, the American cars compare very favorably with them, and especially in the matter of price.

The Ford Motor Company, who exhibit several cars, have produced a machine that, in running qualities, appearance, and particularly in price, is typically American. Built to stand the strain of uneven American roads, and with an appreciation of the national dislike for fussy complications, the Ford easily earns its sub-title, "the car of satisfaction."

Simplicity is the key-note on which this car is built. The characteristics of the Ford car are the gasolene double opposed-cylinder motor, the bearings of which are absolutely dust-proof and the parts extraordinarily few; a transmission gear consisting of only five gears contained in and protected by an oil-tight, dust-proof case, nine inches in diameter by five inches in length; control obtained by means of one lever, and a pedal on the footboard operating the reverse; and water and gasolene tanks of ample capacity for a 100-mile run, so placed as to be easily accessible for filling.

The body is attached to the running parts so as to be removable through the loosening of half a dozen bolts only, making it easy to get at any part of the working mechanism.

To sum up, the Ford is a thoroughly tested car, ready to run at a moment's notice, or no notice at all, over any reasonable road, and to climb any reasonable hill, without giving the least anxiety to the driver.

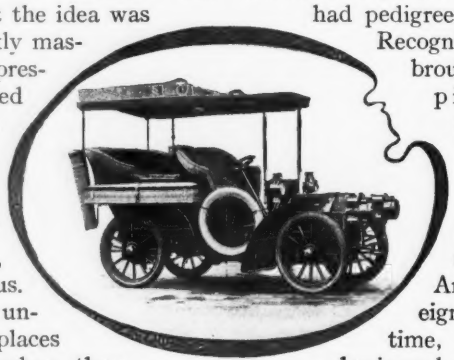
Besides the Ford Runabout and the Ford Tonneau the chassis of the machine is shown, frankly revealing the working mechanism to the public gaze. Henry Ford, the inventor of the Ford motor-car, will be remembered as the man who broke the world's straightaway record with the famous "999," making a mile in 39 2-5 seconds on the ice of Lake St. Clair last winter. The story of the building of the Ford car and of the development of the business is a typical example of American enterprise. The Ford Motor Company's factory is situated in that centre of automobile industry, Detroit, Michigan.

AUTOMOBILES AND AUTOMOBILE BOATS

NOTABLE ACHIEVEMENTS OF AMERICANS — THE "FIRST AMERICAN MOTOR-CAR" — THE RESULT OF SKILL AND PATIENCE — MOTOR BOATS MAKE NEW CHAPTER OF SPEED RECORDS

THE quick, restless energy which characterizes and dominates American life has some drawbacks. In the main, it is good, but it is not all good. It not only demands results, but results in the shortest possible space of time. It not only requires progress for each successive minute, but visible or discernible progress. Its record of achievement makes little mention of matters requiring patience and honest endeavor. It is willing to labor, but not to wait.

All this, by way of introduction to the subject of automobiles and their makers, for this topic, better than any other that comes readily to mind, illustrates the remarks above set forth. Unlike the telegraph, the sewing-machine, and the telephone, the automobile is of foreign extraction. But America quickly saw that the idea was good; she seized it; quickly mastered the principles, and presto!—the land was filled with American "red devils" and their dust. These machines, if anything, were just a little more "devil" than "red," for, while they cost money, they were obstreperous. They wouldn't go; they unkindly balked in bad places they even shied; and, when they did go, they quickly wore out.



The fact was, the American manufacturer saw that the motor-car was a go, and that there was a chance to make money. With true American force and energy he entered the new field, built his plant, gathered what mechanics he could find—none of them skilled in this line—hastily designed his tools and machinery, and practically threw together what was well called a "horseless carriage." A "carriage," because it was a wheeled vehicle for the conveyance of persons; "horseless," because it disposed of horses; but an "automobile" hardly, for, in the practical sense of the word, it was not self-moving; and when, in its "lucid intervals," it did move, it quickly reached the repair-shop or the scrap-heap.

Then became apparent the fact which has remained apparent until recently, that foreign-built motor-cars were vastly superior to our own make, and were, in truth, the only cars which were practical. They would not only go, but they would come back. They would run not only today, but tomorrow also; they ran up as well as down hill; they triumphed over mud, sand, snow, and even fordable water. They cost money, but they were *automobiles*, and they invariably satisfied a purchaser. Like the perfected product of the scientific, careful breeder of animals, they had pedigree and were thoroughbreds.

Recognition of this state of affairs brought into existence the pioneer importing firm, Smith & Mabley. This firm, now incorporated, quickly saw that the building of automobiles must be learned; that to do this required not only American energy, but foreign plodding. In the meantime, they could build up a business by selling motor-cars made by manufacturers who had taken time to learn the business.

That was more than three years ago. Since then, not only has a reputation been earned for selling good cars only, but the knowledge and facilities for building them as well have been acquired. Today an American motor-car worthy of the name, from the minutest detail to elegance of finish, equal in every particular to the best imported product, is a reality.

It's the Smith & Mabley "Simplex."

After all, the homely philosophy of the Deacon who built Oliver Wendell Holmes' famous "One-Hoss Shay" is the only true one in the manufacture of vehicles:

> "Fur," said the Deacon, "'t's mighty plain,
> Thut the weakes' place mus' stan' the strain,
> 'n' the way t' fix it, uz I maintain,
> Is only jest
> To make that place uz strong uz the rest."

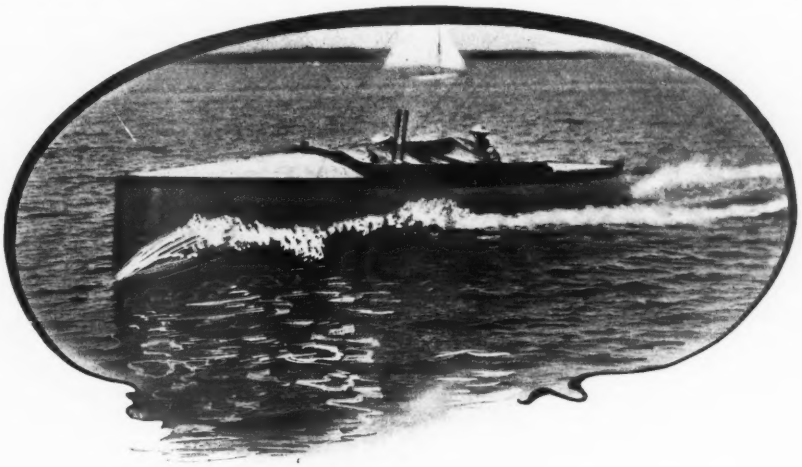
The only trouble with this kind of work is that, for the average manufacturer, it doesn't make money enough. It means a sacrifice of quantity for quality. Quality means reputation; quantity means profits—for a time at least. There you have it. That's why, up to the present season, the American automobile has been at best a reproach. That's why every purchaser of cheap motor-cars has either given up in despair or finally secured a high-grade, or, in other words, imported car. That's why it's important to know that the real "First American Motor-Car" has arrived. It's the Smith & Mabley "Simplex."

This superior product is the result of a frank, open study of foreign methods of manufacture combined with American adaptability and ingenuity. It has taken time, patience, and money. Every bit of material in it has borne the most rigid inspection; every detail has been carefully worked out, not only individually, but with reference to every other detail; motor, chassis, body, and finish are of the most approved type.

Naturally, the perfection of a practicable motor for automobiles led to its use in boats. Light, trim hulls became possible, new shapes came into vogue, space was conserved, and speed to the heart's content.

As an auxiliary power to steam and sail yachts, the automobile motor is without a peer because of its lightness and strength. A Smith & Mabley motor occupying only 13 cubic feet of space (29 x 36 x 38 inches) develops full 30 horse-power. In the automobile boat, the motor is placed forward, where a single person acts both as engineer and steersman.

The *Challenger*, with a 40-foot hull and a Smith & Mabley "Simplex" 150 horse-power, 8-cylinder motor, has already covered a course of 21 miles at a rate of 26½ miles per hour.



In this connection, it may be noted that Smith & Mabley, whose famous garage is at 513, 515, 517, 519, 7th Avenue, New York, are the only American boat-builders who will compete abroad this year for the International Harmsworth Automobile Boat trophy. This, it will be remembered, was held by France; a year ago, England won it. It is to auto-boats what the James Gordon Bennet cup is to automobiles and the American trophy is to sailing yachts. Three boats are eligible from each country. The contestants this year from abroad will be from England, France, Germany, and Italy. It will, therefore, be a struggle worth watching.

The Smith & Mabley exhibit at the World's Fair at St. Louis will be highly interesting and extremely creditable. Its inspection will furnish visitors and inquirers with the latest achievements in automobiling and auto-boating in America.

TRANSPORTATION BY AUTOMOBILE

AT the four corners of the great Palace of Transportation at St. Louis are statues typical of the progress made in transportation since the signing of the Louisiana Purchase. In one corner stands the figure of a woman, and, in her hand, she holds out to all who throng beneath her the most modern development of the vehicle industry—a model of the Oldsmobile. It was by no mere chance that the managers of the St. Louis Fair selected the Oldsmobile as the ideal of transportation progress; for the Olds Motor Works are not only the pioneer builders of automobiles in America, but they have the largest factory in the world, the product of which is greater and perhaps more widely distributed than that of any other automobile concern in the world.

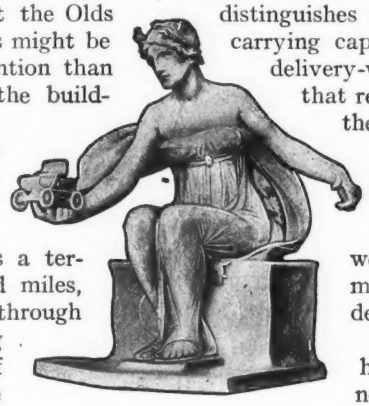
The fact, therefore, that the Olds Motor Works occupy the largest and most prominent space adjacent to the main entrance is most fitting. In addition to the original Oldsmobile, a patriarch of motor-cars, their display includes one machine of every type manufactured by them. The evolution from the progenitor of 1887 to the graceful runabout and touring-car of 1904 is most remarkable. The genealogy, however, is traceable in the cars that surround the parent Oldsmobile, and every machine, from the 1887 model down the entire line, is serviceable today.

The Oldsmobile runabout, with its graceful curved dash, is probably the best-known and the most popular car in America, and it is perhaps the most widely used American car abroad, where it has had an unprecented popularity.

Beside the runabouts, a fine exhibit is made of their light tonneau. The Oldsmobile Light Tonneau has all the good qualities of the runabout, and, in addition, a double-seating capacity and greater power. This machine has the familiar hood, in which is the radiator, the gasolene- and water-tanks; here, too, are placed the batteries, inclosed in an iron case. Easy access to both tanks and batteries can be had by simply removing the hood. The cylinder of the 10-horse-power motor is beneath the hinged footboard, where it is readily accessible. The steering apparatus is of the worm-and-gear type, and the steering-post is so arranged that it can be tilted forward or back, so as to be adapted to the comfort or convenience of the driver. In addition to

the two types mentioned, the Olds Motor Works exhibit their Oldsmobile Touring Runabout—a two-seated car, which has all the characteristics of the Light Tonneau, except that it is of lighter construction. It has a 7-horse-power motor and shorter wheel-base, with lines better suited to a runabout.

"NOTHING TO WATCH BUT THE ROAD" a motto applied to the Oldsmobile runabout by its makers is a happy phrase because it is essentially true. During the only transcontinental run ever made by a runabout, the Oldsmobile drivers, Messrs. Whitman and Hammond, had all they could do to watch the road, while their little car did the running. The machine that made this wonderful run from the Pacific to the Atlantic—from California to Maine, entirely by its own power, is also at the Olds Motor Works exhibit, and, as might be supposed, receives more attention than any other automobile in the building.



One of the most wonderful performances of the little "Olds" was last October, in the famous New York-Pittsburg Endurance Run. It was a terrible ordeal of eight hundred miles, and half the way the course lay through the path of a devastating storm. Among the array of big, high-powered cars, the little Oldsmobile runabout was entered—four and a half horse-power, eight hundred and fifty pounds weight. Most of the big cars for one cause or another—it was an awful strain—were stalled for repairs sooner or later, but the four and a half horse-power runabout scaled mountains that were as slippery as a pane of glass, and plowed valley roads that were several inches deep in mud, or as many feet deep in water. It was a test that no man could demand that a car should stand, one that racked every bolt and nut and piece of steel in the machine, but straight onward went the Oldsmobile, without a flinch, and finished at Pittsburg among the leaders, the first in its class.

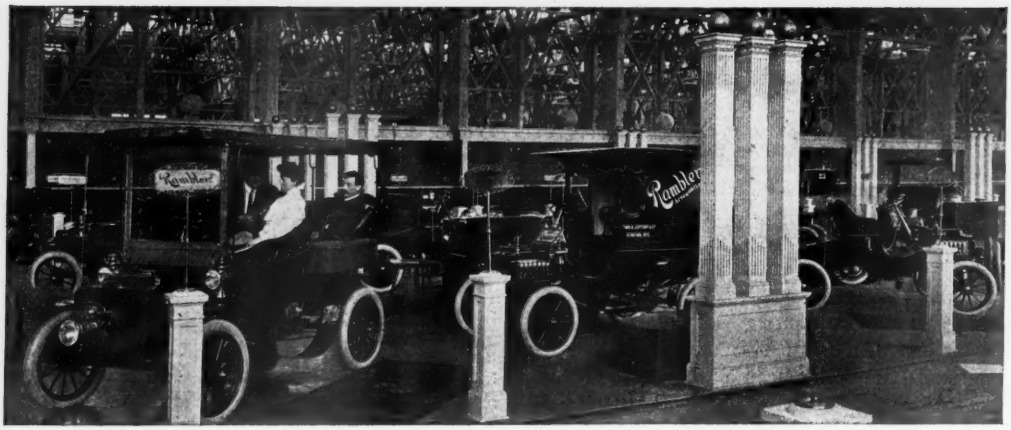
The Oldsmobile's triumphs, however, have not been confined to this country: in a recent contest in Italy, arranged by several Italian automobile manufacturers, an Oldsmobile runabout secured the greatest number of points, and won the contest. This little car, moreover, was bought from the regular stock, and the Olds Motor Works' agent had no idea of the use to which the machine was to be put. The Oldsmobile won on the following points: regularity of speed, consumption of fuel, easiness in climbing, general condition of the chassis, working of the brakes, solidness and practicability of the canasserie, and comfort and speed.

In the recent test of automobile-wagons, in New York City—in which their overwhelming superiority to horse-drawn wagons and trucks was demonstrated—in every case and in every class the Oldsmobile Delivery Car was first in its class. At the exhibit in the Palace of Transportation one may notice that the Oldsmobile light delivery-car has much the same graceful appearance that distinguishes the runabout; it has the same carrying capacity as the ordinary horse delivery-wagon, but, as demonstrated in that recent test in New York, it does the work of three men, three horses, and three wagons. The ability of the Oldsmobile Light Delivery-Car to "deliver the goods" despite the weather has commended it to many business houses, and the demand is steadily increasing.

In the centre of the exhibit, hemmed in by Light Tonneaus, Touring Runabouts, Oldsmobile Light Delivery-Cars, Oldsmobile Railway Inspection-Cars, all these Olds automobiles forming a sort of guard of honor, is a case containing cups and trophies won by Oldsmobiles; and a goodly show they make. But it is what these trophies really mean to the automobile world, rather than their actual beauty and worth, that is the vital part of world-wide interest. They mean that here is an automobile concern that has achieved a great success, not of an ephemeral sort, but a success as firm and lasting as bed-rock, that has been gained through long experience and expert management. They mean that here is a car that you can rely on through rain or shine, for it has been tried again and again and has not been found wanting.

The Olds Motor Works factory is in Detroit, Michigan, but you see Oldsmobiles wherever you go, and they go wherever you see them.

THE RAMBLER EXHIBIT AT THE WORLD'S FAIR



THE SWIFT RAMBLER FAMILY

THE people of bygone generations could not conceive of the luxuries of travel that we of this century enjoy, nor can we appreciate the hardships they endured. In the Transportation Building, however, one can trace the evolution from the days before the idea of wheels was created through the bullock cart, stage-coach, and iron-strap railway periods to the Pullman cars and the pneumatic-tired automobiles of the present day.

It was a slow growth from the low level of the slab-wheeled ox-cart to the height of transportation achievement—the Rambler automobile. But the whole process can be traced in the Transportation Building—the ox-carts are there, and in ludicrously clear contrast to the Rambler automobiles, the Alpha and Omega of road transportation. "By their works ye shall know them" is the text from which the whole policy of the Thomas B. Jeffery & Company is evolved. The Rambler cars are built to do their work on American roads under all conditions. And another policy of the builders is to furnish automobiles at the lowest price consistent with reliability. It is interesting to see how these two principles work out. The most important member of the Rambler family is Model "L," a five-seated car, fitted with a canopy-top and swinging, beveled, plate-glass front, having double opposed-cylinder horizontal engine of 16 horse-power, of ample power to overcome a 45 per cent. grade.

This machine, like all Ramblers, is built with the simplicity idea uppermost. There are comparatively few working-parts, therefore, and the action is so nearly automatic that the proverbial child could almost run it.

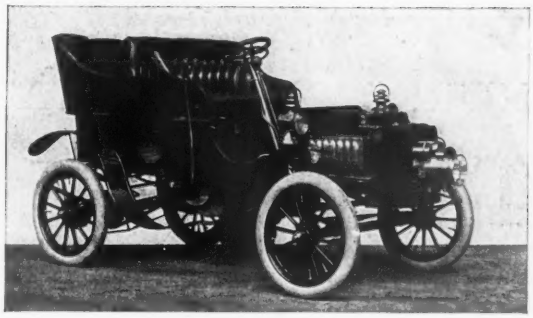
To illustrate: The ignition of Rambler motors is controlled automatically by a governor so arranged as to utilize the full power; it is not left to guesswork that so often proves faulty, nor are back explosions possible, the chance of injury to the starter being altogether eliminated. The machine is entirely controlled by two levers—the one, the throttle, lies under the driver's hand, being a ring of brass under the steering-wheel, which tilts up and down, as occasion requires; the other, controlling the power-transmitting mechanism, is at the right hand of the driver, and by means of this lever the low and high speed is controlled, while the reverse is operated by a pedal on the front board—an arrangement which makes it almost impossible to reverse the carriage by mistake. Another thing that makes for simplicity is the cooling system; no pump is required to perform this important function, consequently the driver need take no thought of this part of the machine's working. Ramblers are cooled by the well-known thermo-syphon system of radiation—that is, by means of the heat generated by

the motor itself, the water is syphoned from the water-jacket and forced through the radiator.

The radiator is placed in front under the hood, as are also the gasolene and water tanks, and the air, after passing through it, flows directly on the motor.

Not the least of the extraordinary things about Model "L" is the price, which is but $1,350. Few cars of the capacity of Rambler Model "L" sell for less than $2,500.

One of the best-known pieces of work which a Ramber accomplished was the New York-Pittsburg Endurance Contest, which took place during a series of rains so heavy that many railroad trains were tied up. Nine cars out of thirty-nine arrived on the day scheduled for the finish of the journey, and, of these, the Rambler was sixth, the Rambler being the only car of its class to make all the controls.



THE RAMBLER TONNEAU

Between the two aisles of the Transportation Building, in the wide space reserved by Thomas B. Jeffery & Company, is exhibited one of every member of the Rambler family, all clothed engagingly in dark red, graceful of line, but having a businesslike, sturdy air withal that begets confidence. Beside the largest car, Model "L," already mentioned, Model "K" is exhibited (Model "L" without the canopy and touring equipment), $1,200; Model "J," without the tonneau, $1,100; Model "H," capacity for four passengers, seven-horse-power engine, $850; Model "G," a two-passenger runabout, "ironed" to receive tonneau, $750; and a most attractive delivery wagon, having a capacity of two cubical yards (500 pounds) of merchandise and two passengers, $850.

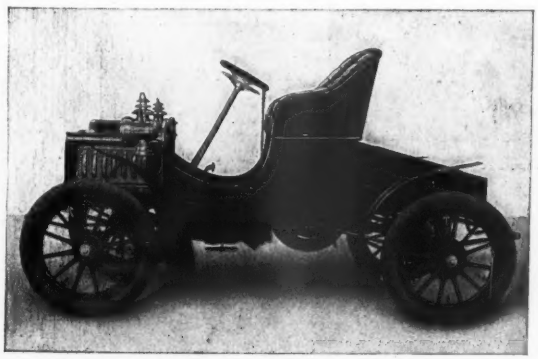
THE RAMBLER DELIVERY WAGON

There are three special reasons why Rambler cars cost so little:

First.—The Rambler has fewer parts than similar automobiles.

Second.—The factory is one of the largest in the country, and none is better equipped to make metal parts more economically.

Third.—Without bondholders, stockholders, executive board, or a multiplicity of high-salaried officials, and with ample financial resources to purchase the raw material in large quantities from their original sources, it will not require much thought to realize the saving along these lines. Though the evolution of automobiles is still going on, it will be some time before the present product of the Thomas B. Jeffery & Company factory, of Kenosha, Wisconsin, will be surpassed.



THE RAMBLER TOURING CAR

HORSE NAILS THAT MAKE RECORDS

THERE is much talk nowadays about the waning interest in the horse and the growing popularity of the automobile; yet, a short time ago, a race was run in the World's Fair City, St. Louis, the prize for which was $50,000, and the crowd that went to see the great event taxed the accommodations to the utmost. In spite of all the talk about the beginning of the "horseless era," a factory devoted exclusively to the manufacture of horse nails, which occupies nearly a whole city block, or square, at Hartford, Connecticut, is kept running to its full capacity.

CAPEWELL HORSE NAIL CO.'S BOOTH

As the visitor to the World's Fair wanders down the main aisle of the great Palace of Manufactures, he is attracted to two frames containing groups of gilded horseshoes, and under them names familiar in newspapers the world over—Lou Dillon, Joe Patchen, Dan Patch, Major Delmar, John R. Gentry, Star Pointer, and many others almost as well known. What a succession of triumphs won the names suggest! On closer inspection, one notes that all these famous horses have carried in their victories Capewell horseshoe nails, and the golden horseshoes are those worn when the records were made.

Almost without exception, the great trotting and pacing records have been made by horses whose shoes have been held on by nails made by the Capewell Horse Nail Company, and this fact is more significant than at first appears, for a horse with a loose shoe is practically out of the race, and if one is lost during a race the game is up for that time, even if permanent injury does not result. The same thing is, of course, true in the case of a road horse.

The Capewell horse nails are made of Swedish iron and are cold-rolled to their proper shape. This gives them an unsurpassed tensile strength and a penetrating quality that makes sure that the nail, when driven into the hoof, will not bend or split, though they have sufficient flexibility to allow of clinching.

Among the great races in which Capewell nails have been carried to victory is the historic race between Cresceus and The Abbot

at Brighton Beach, August 15, 1901, for a purse of $12,000. The following cut is from a picture of the race, done by Gean Smith, the famous artist, who was an eyewitness. His oil-painting, reproduced in colors (entitled, "A Whirlwind Quarter," because the fastest quarter ever trotted in a race), on a card 22 x 28, is mailed free to

A WHIRLWIND QUARTER

any part of the world upon request addressed to the Capewell Horse Nail Co., Hartford, Conn. The letters below show that both horses were shod for this race with Capewell nails.

I shod "Cresceus" several times last season, including his race with "The Abbott," and used the Capewell nail on all occasions. I have used the Capewell Horse Nail for several years on all the principal race-tracks of America, and cannot recall an instance where a shoe has been lost during a race. J. E. GRASSIE.
Goshen, N. Y.

I hereby certify that I shod "The Abbott," 2.03¼, champion gelding of the world, for his match with "Cresceus," at Brighton Beach, with Capewell nails. I consider them to be the best nails manufactured.
Glenville, Ohio. W. B. KOPE.

At this company's exhibit at the World's Fair, various styles of horse nails are shown: corrugated nails, which require no clinching; nails for city work; lighter nails for soft country roads; and still more delicate nails for track work. All, however, are made of the same sterling metal, which is so tough and strong that a nail rolled out to a ribbon the thickness of heavy paper and three feet long shows not the slightest sign of weakness, and may be coiled to fit in a pill-box, and on being released springs out to perfect straightness.

It was Benjamin Franklin who said: "A little neglect may breed great mischief: for want of a nail, the shoe was lost; for want of a shoe, the horse was lost; for want of a horse, the rider was lost, being overtaken and slain by the enemy—all for want of care about a horseshoe nail." A Capewell nail can always be depended on, and neither shoe, horse, race, nor rider could ever be lost on account of it.

For almost a quarter of a century Capewell nails have been manufactured, and today more of them are used throughout the world than any others.

The company has received letters from all over the world, showing a widespread use and universal satisfaction with the nails that win records. A few letters follow.

Please arrange so that I can get your nails here. I find, in shoeing both trotting and running horses, that they are the most satisfactory nail made.
King Edward's Stables, L. C. THOMAS,
Wansborough, Swindon, England.

When I accepted the position of shoer for the Moscow Trotting Club, of which the Czar is president, I brought a lot of Capewell nails with me, and have sent several orders since. I have shod all the best trotters and runners in Russia, and always with Capewell nails, and have never lost a shoe.
Moscow, Russia. THOMAS P. MACK.

Capewell nails are the best nails that have yet been found in this part of the world.
Nirasaki, Japan. KOYO VETERINARY HOSPITAL.

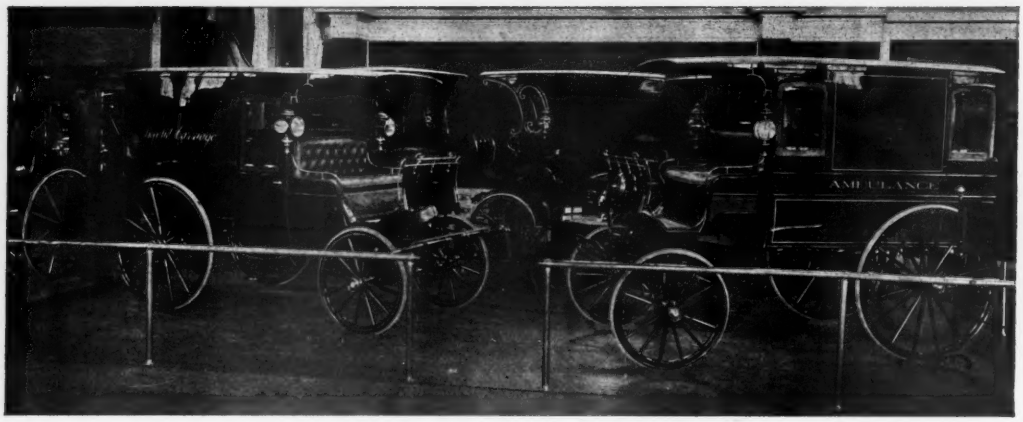
I shoe for the Master of the Kings County Foxhounds, and others, who have a trying country, over mountains and bogs, where the steel was often left behind; but, since I began to use Capewell nails, the steel always comes home.
Kinity, Kings County, Ireland. JOSEPH GUILFOYLE.

The booth of the Capewell Horse Nail Company at the World's Fair is worth a

FACTORY AT HARTFORD

visit from any horseman, and is an evidence that there is no lack of interest in horseflesh, while the fact that their great factory is kept running full blast indicates that the *genus equus* is not yet on its way to the bone-yard.

THE EXHIBIT OF FULTON AND WALKER COMPANY, OF PHILADELPHIA



FIRST AID TO THE INJURED

AN interesting exhibit in the Palace of Transportation shows the wonderful improvement made in the building of vehicles. The step from the rude, springless bullock-carts, the earliest vehicles, shown in one part of the building, to the modern ambulances shown by the Fulton and Walker Company, is a long one. But if a vehicle of their kind built a few years ago was placed beside one of those exhibited at the St. Louis Fair, the marked difference would be noticed at once.

The Fulton and Walker Company, of Philadelphia, have designed a number of these vehicles of mercy that have become standard in this country. To convey the sick or injured from place to place with the least discomfort and danger at the greatest speed has been a problem that they have solved wonderfully. In the ambulances displayed, every device that could possibly add to the comfort of the patient and the convenience of the doctor has been used. A notable improvement employed in one style of the Fulton and Walker Company ambulances is called the coupé front. This ambulance has side doors as well as the regulation opening at the rear. By means of the side door the patient may step in, as if it was an ordinary carriage, and then assume a reclining or sitting position, whichever is preferred; the side door also allows of easy access of the surgeon to the head and shoulders of the patient. This is but one of the many devices used to make these carriers of the sick nearly perfect; but it will serve to show the care and painstaking effort expended in building these difficult vehicles.

The hospital favorite ambulance is another of the improved styles of ambulances shown in the exhibit. This ambulance is considered to be the best-equipped vehicle for suburban or hospital work in either large or small towns. The inside arrangement is the most complete, having all requirements for the service—medicine-chest, stretchers trimmed complete with leather, lantern, and seats for physician and attendant.

In addition to their ambulance work, there are business wagons of the latest delivery type. Their business wagons, coaches and trucks have a national reputation, and the users of their vehicles may be found in almost every important city of the United States. Fulton and Walker Company wagons carry the United States mail, and the government includes two styles of their product in the model Post-office exhibit.

Their ambulances in the Red Cross service are well recommended, and used in government service.

It would be difficult, indeed, to find a commodity that is not carried in their wagons. Colgate & Company, Adams Express, American Express, National Biscuit Company, are some of the well-known con-

cerns whose products are transported in these wagons, and such widely different work as carting Baldwin locomotives, street-sweeping, and garbage-collecting is creditably performed by the product of their factory. It is no idle boast of this company that they can supply the need for any kind of wagons for ordinary purposes, and carry them in stock ready for delivery within a few hours, properly lettered and ready for work.

THE HOSPITAL FAVORITE AMBULANCE

It is a common thing, nowadays, to make business vehicles serve as advertisements as well as carriers, and the opportunities for valuable publicity at small cost is well worth considering. The designing of special vehicles for special uses is one of the important departments of the Fulton and Walker Company works. The highly decorated wagons designed for advertising purposes, built by them, have been remarkably successful, and they are prepared to make special designs or carry out plans prepared by others.

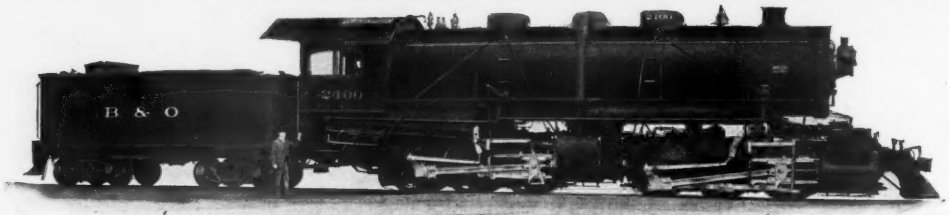
AMBULANCE WITH COUPÉ FRONT

The carting of products from factory to the railway, or of merchandise from store to customer, swiftly and safely, is quite as important as the transportation by rail or water from city to city; moreover, the character of a business house is often judged by the appearance of the wagons that carry its goods. A successful business wagon, truck, hotel-coach, or hand-cart must be attractive in appearance, durable, of the latest style and most approved model; and in all these qualities the Fulton and Walker Company vehicles excel.

Special attention has been paid to the building of motor-driven vehicles; automobile-ambulances, and other carriers will be supplied to fit any need. It has been the aim of this company to keep in the advance line of vehicle construction. It studies human needs and builds to meet them. This adaptability has been a distinguishing feature of Fulton and Walker workmanship for nearly two generations—during the whole life of the company. The result is that people everywhere have come to know that a vehicle need which this company has undertaken to meet is met in the fullest possible way. The business man knows that a company which builds the ambulance which is everywhere accepted as the standard can be depended on to produce the best delivery wagon. So with vehicles reaching from the two extremes of human need, for the hospital and for the business house, the Fulton and Walker Company is developing along broad lines, equipped for its work by fifty-eight years of experience and by a thoroughly modern factory.

Full information regarding ambulances and business vehicles of all kinds will be gladly given either at their exhibit in the Palace of Transportation at the World's Fair in St. Louis, or on request to the Fulton and Walker Company, 20th and Filbert Streets, Philadelphia, Pa.

MALLET ARTICULATED FOUR-CYLINDER COMPOUND FOR HEAVY FREIGHT AND PUSHING SERVICE



LARGEST LOCOMOTIVE IN THE WORLD
BUILT BY
AMERICAN LOCOMOTIVE COMPANY

LARGEST LOCOMOTIVES IN THE WORLD

FROM the Nile boat of Pharaoh's time to the locomotive of the present year is the long sweep that has been arched over in the Transportation Building. And this marvelous contrast, which in itself is a very accurate measure of civilization, is not more interesting than are the proofs of American adaptability in invention, of which the transportation exhibits are a convincing witness. For example, the constructing engineers of the American Locomotive Company study the physical characteristics of the entire country from the Atlantic to the Pacific, and then build an engine to meet them.

In connection with the accompanying pictures of them, it is interesting to describe these various types in detail, for they mark the highest standard that has been reached in locomotive building, and illustrate, in a striking way, the great progress that has been made in the eleven years since the world's fair in Chicago.

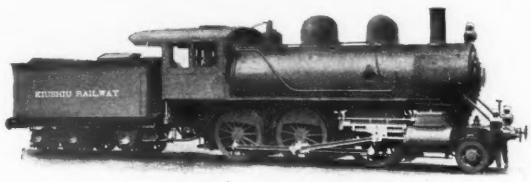
They show, too, in what a national way the American Locomotive Company has studied the transportation needs of the American people in three of its standard types—the "Atlantic," the "Prairie," and the "Pacific." For example, the Big Four engine (illustrated on page 5099 of this magazine) on the turntable represents a passenger locomotive used extensively on the large systems where the passenger trains do not exceed ten to fourteen cars and where the track is more or less level. This locomotive—popularly called the "Atlantic" type—has a four-wheel front truck, four driving-wheels, and a trailing truck. The weight of this engine and tender is 163 tons, and it has 50 tons on its driving-wheels. Another locomotive of this type exhibited stands ahead of the famous Empire State train of the New York Central. This engine is heavier than the Big Four, having 55 tons on its driving-wheels, and is of the four-cylinder, balanced, compound type. This is the most powerful passenger locomotive in the world. The third engine, of the "Atlantic" type, was built for the Vandalia Line of the Pennsylvania system.

The second type exhibited is a passenger locomotive used on railways whose passenger traffic is very heavy, and where the trains are made up in sections of from fourteen to eighteen modern heavy cars of 45 to 60 tons weight. This is popularly called the "Lake Shore," or "Prairie," type, and is the standard passenger locomotive on the Lake Shore & Michigan Southern Railway. They develop a speed of ninety to one hundred miles an hour between stations, being the fastest locomotives known today. The weight of this locomotive and tender is 160 tons, having 76 tons on the drivers.

The third type is represented by the locomotive ahead of the Missouri Pacific train. This locomotive is suitable for railways with heavy grades and considerable curvature, where it is desirable to obtain high speed combined with heavy tonnage. This type, known as the "Pacific," is recognized by its particular wheel arrangement, having a four-wheel truck in front, three pairs of driving-wheels, and a radial trailing truck. The total weight of the engine and tender is 145 tons, having 61 tons on the drivers.

A noticeable feature in connection with these passenger locomotives is that every one

of the types has a wide fire-box. The power of the modern passenger engine depends on its capacity to generate steam with great rapidity, which, in turn, depends on the ability to burn the greatest amount of coal economically in a given space of time. It is for this reason that the designers of modern engines are led to adopt the wide fire-box, in order to increase the grate area and thereby generate steam rapidly



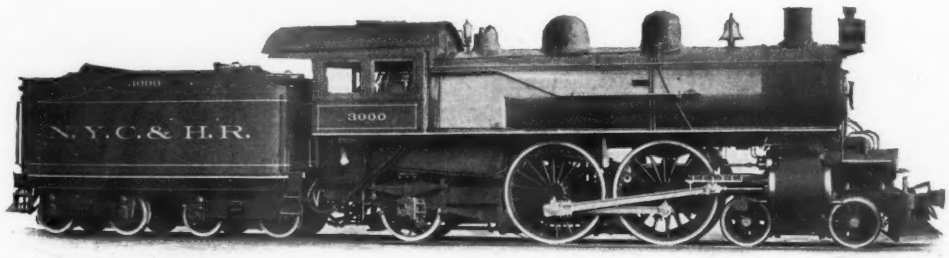
FREIGHT MOGUL BUILT FOR THE KIUSHIU RAILWAY OF JAPAN

One of the means for obtaining the greatest economy for the railway company in handling freight has been to increase its trains from the twenty to forty carloads of about 30 tons capacity of ten years ago to the sixty to one hundred carloads of about 50 tons capacity of today. The economy obtained in heavier trains will be obvious from the fact that it requires the same number of men, or crew, to handle a small train as it does to handle a large one, and the routine work connected with the forwarding from one station to another is also the same. Furthermore, the large engine has proved more economical in its consumption of coal and water as compared with the small locomotive.

The American Locomotive Company also exhibits three consolidation locomotives, built for freight service on the Erie, Chesapeake & Ohio and New York Central railroads.

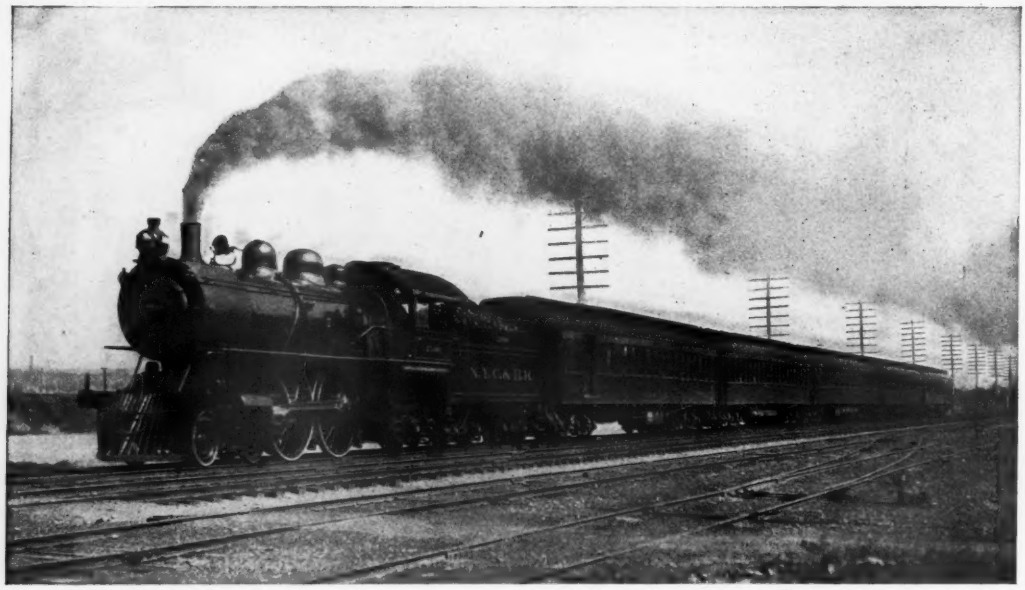
In the Baltimore & Ohio section, the American Locomotive Company exhibits the heaviest freight locomotive in the world. This is the most interesting type of locomotive in the Transportation Building. It has a total weight of 239 tons, of which 167 tons rest on its twelve driving-wheels. This locomotive was designed for heavy mountain service, where it is essential to utilize every pound of weight of engine as adhesive power. It will be seen in the cut shown that this engine has no trailing or front trucks, and while its wheel-base is very long, it can inscribe itself on the shortest curve. This arrangement has been obtained by inserting a double hinge in the centre of the frame and allowing the front three pairs of driving-wheels to displace latterly. In other words, there are two sets of driving-wheels, and the rigid wheel-base is only that of one set. An idea of the power of this locomotive can be obtained when it is stated that ten years ago a locomotive weighing 50 tons was considered a very powerful machine; or, by comparing its weight of 239 tons with the 45 tons weight of the freight locomotive built for service in Japan.

And these great engines tower above the primitive burden-bearers of Egypt across the aisle, and make the salute of the present to the past. For, surprising as it may seem, Egypt is bearing its loads today much as it did in the beginning, while America is forging along at a seventy-mile speed on steel rails. And here, as at no other place in the Fair, is this deeply impressive contrast spread before one's eyes. Side by side with such camel-packs as bore the Wise Men—and such packs are used still—are the monster locomotives that are coming from the different works of the American Locomotive Company.



COLE FOUR-CYLINDER BALANCED COMPOUND FOR FAST AND HEAVY PASSENGER SERVICE

"THE EMPIRE STATE EXPRESS"—THE MOST FAMOUS TRAIN IN THE WORLD



THE LUXURY OF MODERN TRAVEL

THE note of empire-building is the herald of a triumphant progress. On May 1, 1803, through the consummation of the Louisiana Purchase, 875,000 square miles had been added to our area, and the boundaries now stretched from the Rockies to the Atlantic and from the Gulf to the Manitoba forests. This advance gave the occasion for the World's Fair at St. Louis. There, where the stately palaces of the Exposition rise in the very heart of the Purchase, the growth of railway transportation is shown with the glory of American progress.

The imposing exhibit of the New York Central & Hudson River Railroad tells the whole impressive story of the remarkable development of steam-power transportation by land in the United States. On one side stands a fac simile of the original DeWitt Clinton train, the first to run over the Mohawk Valley route, the parent of the New York Central. It made its first trip in 1831, and consisted of a crude-looking engine, drawing three passenger-cars as shown in the illustration. It traveled seventeen miles an hour. Alongside this almost primitive train is the Empire State Express, representing the perfection of modern railway travel; a veritable traveling home of ease and luxury.

But the exhibit of modern achievements for making traveling a luxury is not hemmed within the Exposition grounds. What makes the Fair a Mecca for summer visitors is not only its unparalleled outspreading of wonders, but the fact that a trip to St. Louis affords the pilgrim to the Fair the actual enjoyment, on the way, of those very features of speed and comfort which the objects at the Fair exploit as the marvels which transportation experts have accomplished. To see the model of the Empire State Express, for example, affords a delight to an observer that is doubled with the pleasure of a memorable retrospect if he has glided luxuriously across New York State in the flyer itself.

Further, the New York Central, first among the railroads, has taken a step into a new transportation era. It is now building thirty electric locomotives, which will be tested for a year on a ten-mile stretch of the railroad's tracks at Schenectady, and then put into service. Upon this ten-mile stretch, the engineers, who now use steam-locomotive

flyers, will be thoroughly trained in their duties as pioneers in electric locomotive practice. The electric locomotives which will take trains in and out of the Grand Central Station in New York City must reach the speed now attained by the trains that fly to and fro on the line, and this, on the fastest trains, frequently reaches sixty miles an hour. The unmatched smoothness of the roadbed, equipped as it is with heavy modern rails, insures easy riding: the thorough automatic block-signaling system in vogue, and the training the engineers are receiving, insures safety—the paramount object in the railroad's policy.

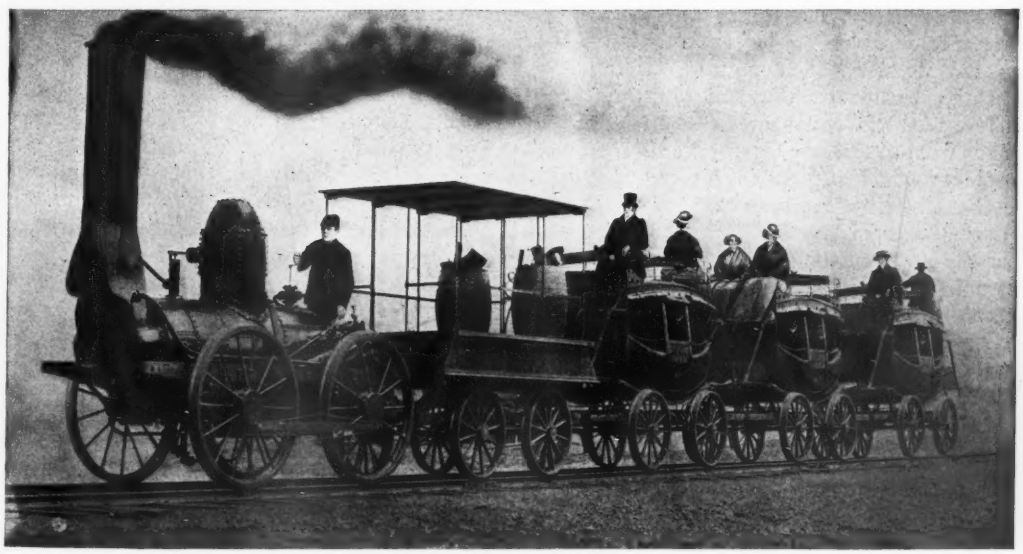
Through modern science a train may be run as smoothly as a ball-bearing bicycle, even when it shoots along at sixty miles an hour. The New York Central, for example, was the first railroad in the United States to ease its curves. The curves on the road are comparatively few for such a picturesquely rugged country as the Central traverses, and these, at great expense, have been made as slight as possible by a scientific device.

Construction engineers have discovered that if, instead of laying their tracks so that a curve springs directly from the straight line the track has been following, they begin far back on the straight to make an extremely slight curve, which almost imperceptibly merges into the necessary curve, the shock and lurch are avoided. The Central has employed this device in building its curves, and the result is that a passenger is not made aware of the change from straight to curved track by the slightest jar.

It is by careful attention to such details as these that the Central has become the avenue *par excellence* from the East to the Fair.

A sumptuous "hotel on wheels," and the pleasurable thrill of speeding behind a racing locomotive, have already become a part of a visitor's experience if his route to the Fair has been the Central. He has enjoyed easy riding in the most luxurious cars provided in the United States, rolling over the easiest roadbed, and hurrying West at a speed notably improved since the Chicago Exposition. And he watches, unrolling before his broad car-window, the panorama of the mighty Hudson, where the Palisades rear their lofty cliffs and where the Catskills lift their domes into the sky.

An interesting development of the broad effects achieved by a great railroad is the excellent magazine, *The Four Track News*, published by George H. Daniels, the General Passenger Agent of the New York Central. Here is a finely illustrated periodical of 100,000 circulation, devoted to travel in all parts of the world—the managers considering that any help to induce people to travel anywhere will, in the end, benefit the New York Central. Surely, a generous and strikingly big-minded policy.



DE WITT CLINTON AND TRAIN ON THE NEW YORK CENTRAL, 1831

THE GREAT INSIDE INN

THE St. Louis Fair represents man's achievements in all the large activities of life, unfolding myriad wonders. But all these splendors cannot be fully enjoyed without proper comfort during the visit to the Exposition. The chief problem, therefore, of this, as well as all other fairs, is the matter of accessible accommodations. This problem has been happily solved at St. Louis in the Inside Inn, which has come to be regarded as one of the distinctive features of the Fair, and almost as much an object of pilgrimage among sightseers as Festival Hall or the Palace of Agriculture. It is not only the largest hotel in the world, but a remarkable meeting-place for nearly all the nations of the earth.

For a number of years, Colonel E. M. Statler has successfully conducted restaurants in Buffalo and other places. For the Buffalo Exposition he built and operated Statler's Pan-American hotel. But this hotel, as well as other fair hotels, whether at Philadelphia, Chicago, or Buffalo, were outside of the fair grounds, and, in many cases, a considerable distance from the gates. Colonel Statler conceived the original idea of a great hotel *inside* the Fair grounds, whose very location would obviate many difficulties and tribulations which attend going to and from a fair in hot weather. The matter was taken up enthusiastically by the Exposition management, who realized that, in Colonel Statler's plan, was, to a large degree, the solution of a problem that confronted the city of St. Louis —that of caring for a monster crowd. Colonel Statler was given the exclusive concession for the hotel on the grounds, thus placing the establishment under the official wing of the Exposition.

As it stands today, the Inside Inn, tree-embowered and looking from the front like an Exposition building, represents an investment of $450,000. It covers ten acres, and contains nearly 3,000 rooms, or three times as many as the Waldorf-Astoria. Built in the shape of a gridiron, it has ample halls which insure plenty of light and air. There are numerous open courts. Every precaution is taken against fire. The walls are lined with asbestos, and a well-drilled fire patrol is on duty day and night. There are over a thousand employees.

In the conduct of the Inside Inn the perfection of comfort for Fair visitors is reached. The guest has merely to register, and the hotel does the rest. The price of every room, from the cheapest room to the most expensive, includes admission to the Fair grounds. This removes one of the great objections to fair-going—long hot waits in line at the ticket booths. You can step from the long, cool hotel piazza and in two minutes reach half a dozen State buildings. The Government Building may be reached by a five-minutes' walk. Within sight of the hotel is an intramural railway station, that makes a circuit of the whole Exposition grounds, with more than seventeen stops convenient to all points of interest. No other temporary hotel in the world represents such conveniences for sightseers.

Located at the east end of the Fair grounds, the Inside Inn commands a beautiful view. It is in the imposing Plateau of States. In front are some noble oak trees. To the right and left stretch the impressive avenues of State buildings, beginning with Indiana on the left and Utah on the right. Through the trees may be seen the dome of the Pennsylvania Building.

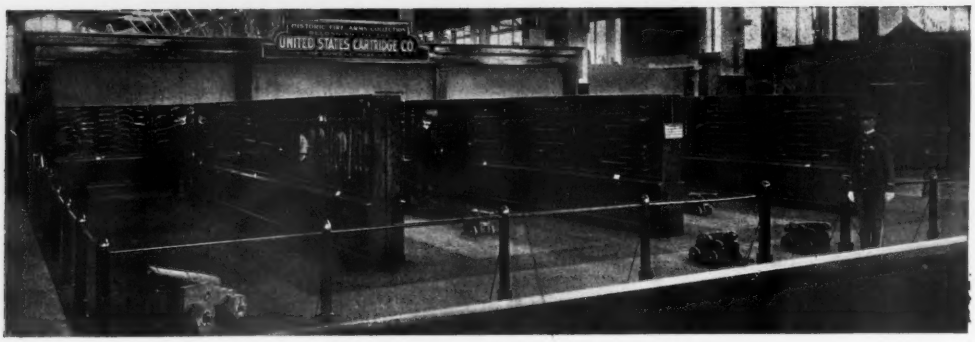
The success of the Inside Inn is a tribute to the executive ability of Colonel Statler. This wonderful power of organization was tested during the first month. On the opening day of the Fair, he was seriously injured in an explosion and removed to a hospital, where for a month he was helpless. Yet so perfectly had he organized his forces for the largest hotel in the world that the management proceeded without a hitch. During the second week, there were 4,200 guests at the hotel, and nearly all were registered and quartered in a single day.

Reservations at the Inside Inn can be made by mail or telegraph, at any time, for any time. The hotel is conducted on both European and American plans.

In the former, the rates are from $1.50 to $5.50 a day; and, for the latter, $3 to $7 a day.

THE INSIDE INN

FIREARMS EXHIBIT OF UNITED STATES CARTRIDGE CO.



THE MOST COMPLETE COLLECTION OF FIREARMS IN THE WORLD

AN exhibit of absorbing interest—in fact, one of the most interesting things in the whole Louisiana Purchase Exposition—is a collection of firearms that shows every step in the evolution from the most primitive bow-gun strung by turning a crank, to the modern small-bore rifles having a range entirely out of proportion to their size and weight. The collection of firearms shown by the United States Cartridge Company, of Lowell, Massachusetts, in the Forestry, Fish, and Game Building, is the largest and most complete in the world. Guns of every description, every age, and all styles are included, so that it is possible to trace the progress in the art of gun-making from the very earliest times to the present high state of development.

This collection is the most complete in the world, containing, as it does, thousands of guns from all ages and nearly every nation. Between the rows of death-dealing weapons, as it were, one can read stories of heroism, of great deeds and noble sacrifices, of maps changed and nations created, and also of the gains in civilization.

The cases containing this wonderful collection, as may be seen from the illustration, are ranged in rows, and are numbered according to the period of the arms contained in them.

For instance, in case one are the bow-guns, the first application of the gun principle, used in the days when hand-to-hand conflicts were the rule and the slaughter greatest.

The invention of gunpowder made the use of barrel and ball possible, and the ingenuity of the early gunsmiths was taxed to provide means to ignite the charge—the collection of match-locks, wheel-locks, and flint-locks shows the primitive devices devised and the gradual improvement through our own Revolutionary War period to the time when percussion caps came into vogue.

Before the days of 1776, the great bell-mouth blunderbusses had come and gone, but a number of these small-sized cannon, with barrels shaped like a bugle, are included in the collection, and one's admiration of the strength and endurance of men who could march with such heavy and clumsy pieces grows as one proceeds along the row.

In the early days, when the combining of different grades of metal was not understood, the gunsmiths were compelled to make up in weight what the metal lacked in strength, and the pieces were correspondingly heavy.

Many guns used by the patriots of the Continental Army are exhibited, and places on the stock where the finish of the wood-work has been dulled by the contact of their cheeks are still visible.

Foreign guns there are also, many of them beautifully engraved, and inlaid with brass, silver, and gold. The Oriental guns, with their long, slender barrels and T-shaped

stocks, so noticeable in the pictures of Arab soldiers, are particularly rich in ornamentation, the woodwork being inlaid with mother-of-pearl and precious metals.

Following along after the guns of the Revolution are the weapons of 1812, and then the guns of '61. In this latter case is a gun that was dug up from under a bridge at Antietam, where it had lain for twenty-seven years—the stock is petrified, and the barrel and lock incrusted with rust of long standing. Another famous gun is the rifle used by John Brown during the Kansas campaign, and still another renowned campaign is suggested by the gun used by Sitting Bull, which was obtained from him in 1876 and added to the collection: both of these firearms bear the evidences of active use. The evolution of the breech-loader and the magazine gun is also shown very clearly. Some of the telescope rifles used by sharpshooters during the war of '61 are shown, and one's respect for them grows when their deadly execution is remembered.

One case is filled with the short carbines used by the cavalry and navies of the world, and still another, with modern rifles, now used by different nations. In this case is exhibited one of the types of rifles used so effectively by the Japanese in the present conflict.

Nor are the weapons used for purposes other than war unrepresented; harpoon-guns, with their projectiles, are shown, and an infinite variety of shot-guns, beside which are a collection of pistols, from the bell-mouth blunderbus pistols that must have suggested the yawning of a cavern when a man looked into it, to a dainty bit of deviltry that could easily be concealed in the palm of the hand. Some of the pistols are provided with long blades, so that, if the shot failed, a sharp thrust would suffice. The collection of pistols and revolvers of every type, from the earliest flint-lock to the most modern six-shooter, is worthy of a special article.

The most wonderful gun of the collection is evidently the production of an Englishman, John Cookson by name, dated 1586. This piece, besides being beautifully chased and inlaid, is provided with a wonderful mechanism, for the time at least, as it is practically a magazine rifle. This gun verifies the truth of the adage, "There is nothing new under the sun," for the piece is both breech-loading and is fitted with a magazine mechanism, yet these improvements were not supposed to be invented until many years after 1586.

This wonderful collection is being constantly added to, though there are at least 250 pieces not included in the exhibit at the World's Fair. A complete catalogue, with illustrations, telling the story of each gun, is supplied to visitors. It is impossible to tell the story of this marvelous collection in this limited space, nor can the history, the deeds of heroism, the acts of self-sacrifice, that lie behind these war-worn weapons, be even suggested here. A study of the actual guns themselves can alone do this.

There is another great story to be told by the ammunition used through the ages of warfare and sport, and, though the evolution is not exhibited, the highest and most modern type of ammunition is shown in the product of the United States Cartridge Company, who are one of the largest manufacturers of metallic ammunition in the world.

THE CREATION OF CARBORUNDUM

SOUNDING through the roar of Niagara is a mighty trilogy in industry. First, there is power which is turned to heat, and this blows its simple cosmic breath on some elements, and, behold, a new product — Carborundum! In all nature, it is unknown; but it is as distinct as iron or gold. Its making is almost a creation, so wonderful is the change wrought in producing it.

With radium, Carborundum is the object of the deepest interest among all the things shown at the Fair. Each is a new substance, unlike anything ever known in all the ages. And to each is paid that meed which belongs to something really "new under the sun." Of course, Carborundum is not so new as is radium, but the broad industrial uses to which it has been put are new, and they are a source of amazement to thousands of people. Many saw the recently discovered crystal at the Exposition in Chicago, and now they are keen to hear of the broad work it has been doing in the world. The whirling pyramid of Carborundum crystals, scintillating all the colors of the spectrum, is a centre of interest in the Machinery Building, together with the innumerable evidences about it of what Carborundum is doing to help men to do their work. And, among all the visitors, there is absorbing inquiry about the discovery of the new substance. What magic there has ever been in that word "discovery"! It conjures up the eagerness that greeted Columbus's discovery of the New World; of the rapt attention that was paid to Father Hennepin's story of first seeing and naming Niagara; of Harvey and Faraday, and Pasteur, and Edison, down to the Curies of the moment. And the story of Acheson's discovery of Carborundum is being told scores of times each day at the Fair. People hear it with all the more eagerness through having the opportunity of seeing what Carborundum has done as an abrasive in metal and leather and stone, performing an essential part in manufacture with an efficiency never dreamed of before.

And this is the story: In the fall of 1890, Edward G. Acheson was conducting an experimental electric laboratory in connection with a lighting plant, at Monongahela, Pa., which he had installed. He had been interested for some time in experiments with carbon, and especially wished to determine the effect of electric heat of great temperature in making various carbides. One day he found crystalization in a mass of carbide of aluminum made from clay, and discovered that it was progressive in amount in proportion to the degree of electric heat employed. As it was the silica in the clay which had crystalized, he at once took pure sand for silica, and continued his experiments. Immediately, he got crude Carborundum crystals almost as hard as a diamond, and he got them from such common things as sand and carbon, acted on by great heat. The news of the discovery created a sensation in the scientific world. In the spring of 1891, Mr. Acheson read a paper before the Franklin Institute, in Philadelphia, which was widely published, and the Institute gave him the John Scott medal and prize. Carborundum at once became a fixed fact in science, recognized everywhere as a discovery of vast importance.

But what would it do? This exhibit at St. Louis is the answer—but that is the cumulative result of ten years. But Mr. Acheson gave practical industrial application to his discovery forthwith. It was first used, with marked success, in the finer arts, to polish

THE CARBORUNDUM EXHIBIT IN THE MACHINERY BUILDING

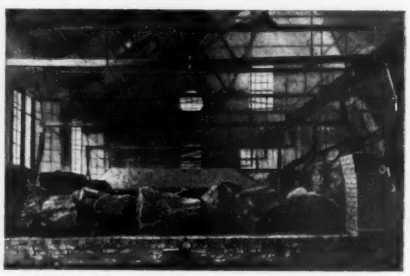
CARBORUNDUM WHEELS GRINDING PLOWS

diamonds and other precious stones. The price was twenty-five cents a karat, or $450 a pound, and the demand far outran the limited supply. And the widening industrial uses to which Carborundum is being put each year continue to exhaust the supply, although more than 5,000,000 pounds were made last year and 8,000,000 pounds will be made this year. In 1895, the plant, which had been on a limited scale until then, was moved to Niagara Falls, and greatly enlarged. With the Titan power produced by the great lakes falling to sea-level, connected with the furnaces to give the heat, Carborundum was made in quantity, and its use in industry widened. Today it sharpens the pen-knife and grinds down the thirty-six-inch shaftings for big battle-ships. It is used in the great gun-works of Krupp at Essen. It fashions and polishes the French heels to my lady's slippers. It finishes locomotive wheels and pearl buttons. Indeed, it is the universal abrasive, in the arts, in industry, in the home. It seems to be as widely used as the elemental heat which makes it. A substance as soft as cork is fashioned into pen-holders with Carborundum, and the hardest of chilled steel is ground down by it. Its flinty crystals seem wholly indifferent to hardness or softness. They plow right into whatever is put before them, just as the steel share ground by Carborundum cuts through the sod. In order to do its work, Carborundum is put into all sorts of shapes—more than one hundred thousand of them in all—wheels, and discs, and triangles, into whatever shape that will be best for the grinding to be done.

In the World's Fair exhibit, the special design has been to show the many and important uses to which Carborundum is put. A big book of testimonials is shown, made up of letters from the greatest concerns in every branch of industry. And then there are actual things that have been done. There is a twenty-four-inch chilled-iron roll, from the J. T. Noye Manufacturing Company, of Buffalo, that has been partly ground down, so you can see just how the Carborundum wheel has done its work.

The Noye Company started experimenting with the use of Carborundum wheels in place of the steel tools, and the figures are interesting. They use for this work a wheel ten inches in diameter and one inch thick. One of these wheels removed, during its life, 8,710 cubic inches of iron; the cubic contents of a 10 x 1-inch wheel being sixty cubic inches. A Carborundum wheel will grind a roll 9 x 36 inches in four and a half hours; to accomplish this same work with a steel tool it takes thirteen hours. The Carborundum wheel accomplishes the work in about one-third the time; and to do all work in the shortest time is what is interesting manufacturers today. No material outside of Carborundum or steel could cut this hard chilled-iron casting; emery would practically make no impression whatever.

There is a soft-rubber roller, from the American Wringer Company, going from

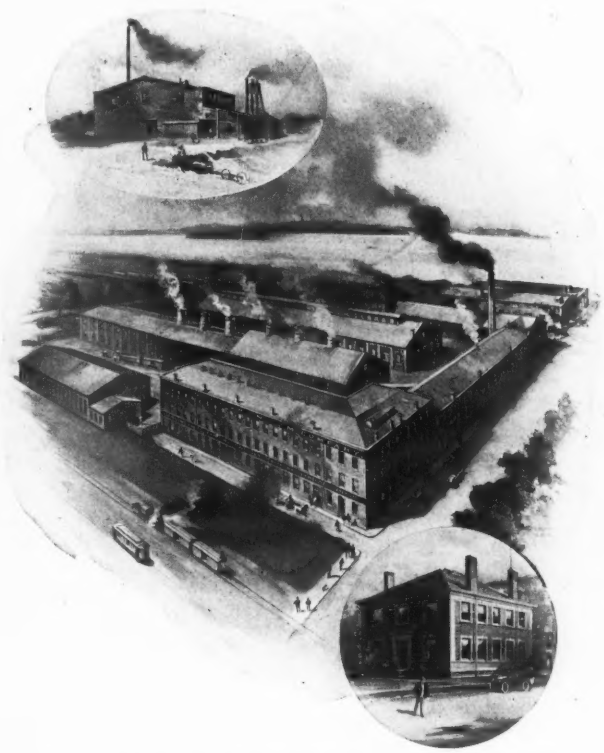


CARBORUNDUM FURNACE AFTER BURNING, SHOWING MASSES OF CRUDE CARBORUNDUM

hard to soft, that has been fashioned by Carborundum. Shoes are shown from manufacturers in all parts of the country which have had their heels and soles fashioned and smoothed by Carborundum. The Inter-

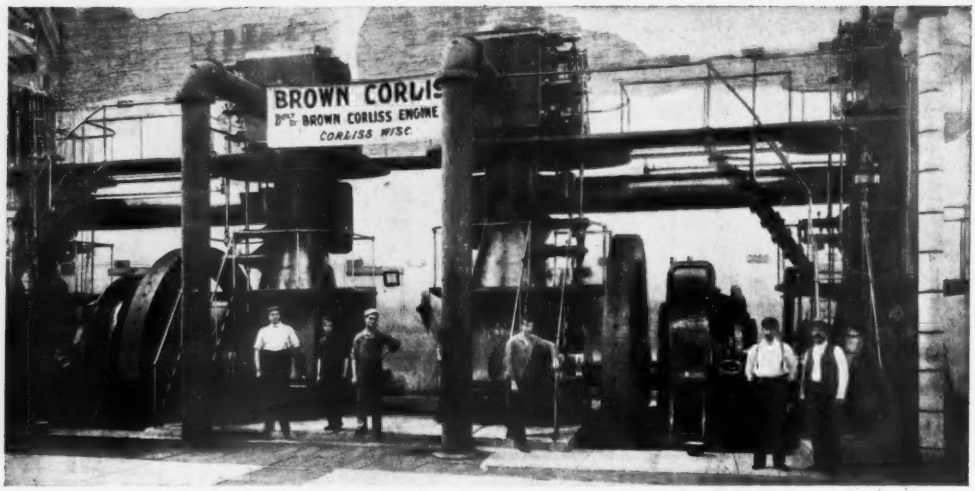
national Harvester Company sends a section of mower-knife sharpened with Carborundum; and granite cutters in all parts of the world, Scotland, Sweden, Norway, Canada, and this country, send samples of the beautiful work they have done with Carborundum. Surely, the discovery of a few years has gone round the whole world of industry, everywhere doing the work set before it. And it has stuck to its work till the last crystal has been worn away. The Wiard Plow Company has written that, by actual record, a wheel twenty-two inches in diameter and two and a half inches thick will grind 54,000 plow points, 450 tons of castings, and 5,000 harrow teeth before wearing out.

And how is this wonderful substance made? That takes one from St. Louis to the great plant of the Carborundum Company at Niagara Falls. Here are the mighty furnaces, seething with a heat of 7,500 degrees Fahrenheit, representing 2,000 horse-power of electrical energy. From the day Tubal Cain fashioned the first plowshare until now, there never was known before such world-melting heat as this. It fuses and transforms the sand and coke and salt and sawdust put into the furnace into perfect crystals—Carborundum. This is the creating stage, and nothing more wonderful has been done in the whole sweep of industry. The masses of crystals are taken and crushed, and then sifted into twenty-nine different grades, according to size. After the crushing and sorting comes the final stage—the combining into different shapes for the widely varying industrial uses that are to be served. The crystals are held together by an adhesive made of kaolin and water, and are placed in molds under heavy hydraulic pressure. These molds are baked in kilns for seven days, and the heat is gradually increased to 2,500 degrees Fahrenheit, and this "firing" is followed by a gradual cooling process. As a final precaution, the most exacting tests are made to discover any flaws, and each piece that passes them all is labeled and made ready to go out in the world to do its work. How this work of grinding is actually done is shown in the exhibit of the Landis Tool Company, adjoining the Carborundum exhibit. Here the whizzing-wheel surely cuts its way into the hardest steel. In the Mining Building, as a part of the Niagara Falls exhibit, there is another Carborundum exhibit showing a full line of products.



CARBORUNDUM COMPANY TEN YEARS AGO AND NOW

As one looks over the wonders Carborundum has wrought, he is apt to feel that there must be some of the weird power of magic about it all, and there is, if one allows these marvels to quicken his imagination. The alchemists looked through long years for a philosopher's stone with which to work wonders. It may be that, as the twentieth century approached, the modest American investigator at last found it in his Carborundum, which has been a touchstone, enlivening all industry and literally working wonders



A GREAT RUNNING EXHIBIT

LIKE other cities having a large population to handle, the World's Fair at St. Louis had the transportation problem to solve, and, although the difficulties presented by crowded streets and long-established buildings did not trouble the Exposition officials, they had to provide a means by which the great distances could be covered, and a service that would be absolutely reliable. Lacking proper railway service, the visiting multitudes would be exasperated beyond endurance. To supply the Intramural Railway, which transports the World's Fair visitors from place to place within the grounds, with electric power, the most reliable engines were necessary, and only absolutely trustworthy machinery would serve the purpose. In selecting the Brown Corliss engines, therefore, to furnish a part of the power for the Intramural Railway, the Exposition Company experts expressed their confidence in them. It will be interesting to see whether the engines justified their trust.

At one side of the Machinery Building, two Brown Corliss vertical cross-compound condensing engines run all day long and most of the night, driving two 500 K. W. direct current electric generators, the current from which flows directly to the mains supplying the trolley wires. One or both of these engines have been running continuously since the Intramural Railway started, and it has not been necessary to stop either of them for changes or repairs. In fact, one day when the trunk-wires from one of the generators run by these engines was disconnected to shorten it, an engine of another make broke down, and the connections were hastily made again, the twin engine meanwhile bearing a double load.

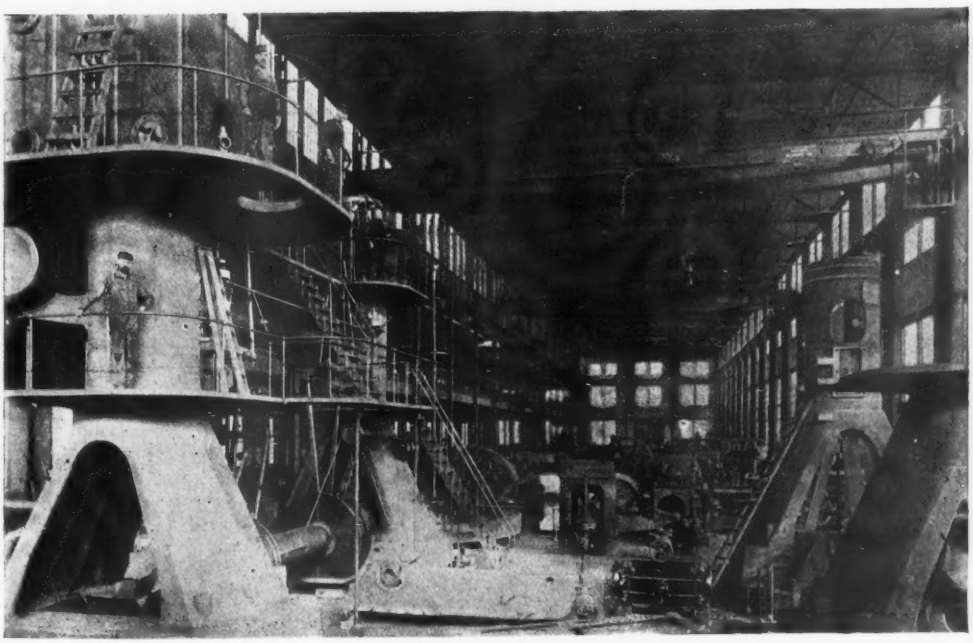
Serving an electric railway with power is particularly trying on an engine, because the loads fluctuate so; the number of passengers carried, the grades encountered, the speed of the cars—all these conditions make a great difference in the weight of the load the prime mover has to carry. Many electric roads equalize this difference through the agency of a storage battery which supplies the extra current needed when there is an overload and absorbs the surplus current from the dynamos when the load is below the standard. The storage battery serves to keep the engine doing a certain amount of work. The Brown Corliss engines that supply power for the World's Fair railway, however, are not aided by an equalizing battery, and have to stand the load that varies every minute. The governor of these engines, which by reason of their efficiency, sensitiveness, and silent action is one of the features, can be easily seen as one walks by; as the load changes, the steel rod of the governor goes up and down, and it is never still a moment, showing the great and rapid fluctuations in the load. It is interesting to watch this exhibit of the Brown Corliss Engine

Company, for it is an exhibit as well as part of the power equipment of the Exposition, because the engines are being tested before one's very eyes, and the statements made regarding them can be verified on the spot. For instance, it is said that the bearings do not rise in temperature more than 5 per cent. above the surrounding atmosphere, and the truth of this statement can be easily proved or disproved by trying it while the engine is doing actual work. Moreover, the statement regarding the output and capacity of the engines can be verified by the volt and ampere meters on the switchboard connected with the exhibit—these instruments accurately measure the product of electricity.

The engines exhibited are of the Vertical Cross Compound condensing Corliss direct-connected type. They are built for high speed, running 135 revolutions per minute, and each unit will, at that speed, develop 750 horse-power at its most economical rating, with 150 lbs. steam at the throttle. Cylinders are 18 in. and 36 in. x 36 in., made double ported so as to give quick opening for steam and, at the same time, give less throw to valve-gear parts and reduce momentum of the moving parts of the gear. All wearing parts are made large, and the oiling system, which is of great importance, is most modern and complete. The engines will give a range of cut-off from 0 to ¾, and will run continuously with 50% overload, or 75% overload momentarily. All parts are accessible, and the engines work noiselessly at a considerably higher speed than they are running at present.

Though the Brown Corliss Engine Company exhibit but these two engines, both of the same type, they manufacture many styles of engines for any kind of work. Engines for hoisting, blowing, pumping, air-compressing, and electrical work of various kinds are but a few of the uses to which Brown Corliss engines are put. Both vertical, horizontal, and combination engines, with cylinders up to 106 inches in diameter, are built at their great works in Corliss, Wis., which has been named after the company and created by it. Every part of the Brown Corliss engines, by the way, is made to gauge, so it is easy to replace any piece that might be damaged.

It is impossible within the scope of this article to describe even a fraction of the achievements of this great firm of engine-builders, but the Brown Corliss Engine Company, of Corliss, Wisconsin, will supply full information, or their representative at their exhibit in the Machinery Building will gladly answer all inquiries.



WHERE POWER IS MADE FOR THE INTRAMURAL RAILROAD

THE "MONOTYPE" AT THE EXPOSITION

IN one of the sections of the Liberal Arts Building, a man sits at work, quietly playing on the keys of what appears at first glance to be an ordinary type-writer. It is not a type-writer, however, but something much more scientifically and mechanically ingenious. It is the keyboard of a Monotype machine, and the operator is really, in effect, setting type at what, as compared with the time occupied in hand composition, is lightning speed. His work may be a page of the *Progressive Printer*, which, during the Exposition, is being set on the Monotype, though it could just as well be a page of THE WORLD'S WORK, or of *Scribner's*, or *McClure's Magazine*, or of one of the countless books or periodicals the type of whose every number is cast and composed by this marvelous machine.

THE MONOTYPE IN USE AT THE WORLD'S FAIR

The Monotype consists of two separate machines, independent of one another, but closely interrelated. Upon the keyboard, the operator spells out, letter by letter, what may be termed an order upon the second machine, or caster, for the type required. This order takes the form of a long strip of paper, in which, as each key is pressed down, tiny holes are perforated. The strip of paper, perforated in a constantly varying, but very meaning, pattern, is subsequently passed through the casting-machine; compressed air is forced through the holes, and by its passage sets in motion what is probably the most ingenious mechanical contrivance ever invented, in such fashion that the character called for by the position of each perforation is cast and automatically placed with its fellows, to form a line of type, "composed" so as to form the desired words. The lines of type differ in no respect from those composed in the old, laborious method by hand. Of no other mechanical type-setter and caster can this be said.

To a practical printer, the overwhelming advantages of this is obvious. Facility of correction is one of them, for a faulty letter can be lifted out and replaced by the right character without disturbing the rest of the line, or having to re-cast it, while general ease of handling is another resultant.

The beauty of a printed page largely depends on the excellence of its "spacing," so that each line, necessarily of varying numbers of characters, may yet fill exactly the same space. This operation is, by the Monotype, performed with a mathematical exactness and precision attainable by no other means.

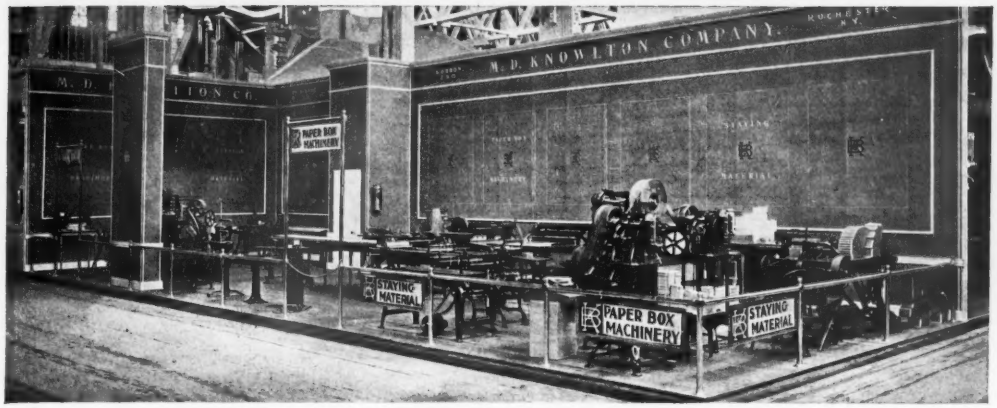
The Monotype provides new type for each piece of work. Each letter leaves the casting-machine sharply cut and perfectly finished.

All that need be preserved is the roll of perforated paper, which has only to be run through the casting-machine a second time to re-create, at nominal cost, the type required for the printing of a new edition.

The production of the Monotype is more artistically beautiful and more technically perfect than that of the hand-compositor, and yet involves the expenditure of less time, less labor, and less cost.

Those interested will do well to write to the Wood & Nathan Co., Sole Selling Agents, No. 1 Madison Avenue, New York City.

THE M. D. KNOWLTON COMPANY EXHIBIT



MAKING BOXES BY MACHINERY

"TAKE it home in a box" is a phrase that applies to almost any commodity in this day of intelligent care for detail and wise advertising methods. One is often led to wonder how the makers of this, that or the other article can afford to pack it in so attractive a box when the selling price is so low.

The secret is revealed to the visitor to the Palace of Manufactures at the World's Fair, who sees the paper-box machinery exhibited by M. D. Knowlton Company, of 29 Elizabeth Street, Rochester, New York.

At this exhibit, one can watch the turning of a sheet of strawboard into a complete box, square, oval, round, tall, or flat, small or large, covered with an attractive lithograph or colored paper, reinforced at the corners with strong paper or metal, and all without hand-work beyond the mere feeding of the machines with their proper material.

The processes of box-making are followed in sequence so that there need be no backward step. At the beginning, the sheets of paper-board are fed to a machine that cuts them to the right size for top or bottom, including sides, and scores it so that the edges will turn up without cracking. The next machine cuts out the corners, the next bends the flanges, and the next neatly pastes a reinforcing stay of strong paper over the corners; a fourth machine pastes the covering paper on the sides, colored or pictured, with a dexterity and neatness that puts a rapid workman's hands to shame; a fifth machine glues on the top and bottom papers, and the job is done —and the whole process would take less time, if carried on consecutively, than was required to write this description. The Knowlton box machinery is so planned as to do this work with the fewest operations and at the greatest speed, and the output therefore is produced more cheaply than by any other method.

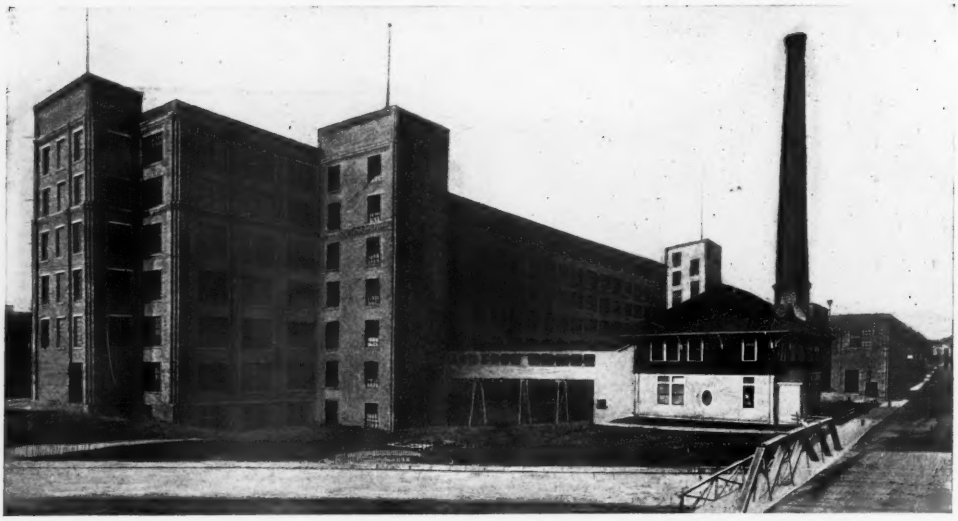
After seeing these ingenious machines at work, the point of view changes, and the thought is how can anybody afford to send out their goods unboxed? Often, too, it is the box that sells the goods, and one is reminded of the song:

> "I sold you the box,
> Not the sox,"
> Said he.

The M. D. Knowlton Company supply machines that will make anything out of paper, and the mechanisms shown at the World's Fair manufacture such widely different objects as pill-boxes and the large paste-board boxes used by clothiers.

They manufacture machines that will roll out a paper tube in almost no time, as small as a walking-stick or large enough to inclose a five-inch shell. Machines for coating paper-board with paraffin, for cutting thumb-holes, for coating with gum, for cutting round and oval shapes, for embossing work, for mixing glue and paste, and machines for many other purposes, special and every day, that save hand-work.

PLANT OF THE SMITH PREMIER CO., SYRACUSE



WRITING LETTERS FOR ALL THE WORLD

FROM the time when the ancient Egyptians cut their hieroglyphics on the tombs of their kings, so that he who ran might read and be informed of the works they had accomplished, to the present when every man in the larger towns can read of events occurring in the four corners of the earth a few hours after they have taken place, the forms of communication have been the greatest educators, and, therefore, the most important civilizing influence. While Japan was shut away from the world her influence was of no account, but now she is counted as one of the great world-powers. The telegraph, printing-presses, correspondence, and the interchange of visits between the Land of the Rising Sun and other nations, have made her influence one to be reckoned with.

What the telegraph has done for diplomatic intercourse, the typewriter has accomplished for the business world. An exhibit in the Liberal Arts Building, however, shows that the Smith Premier Typewriter has played its part in the diplomatic world also. In the space reserved by this company, the typewriter is shown with which the Peace Protocol between the United States and Spain was written, and near-by is a war-scarred Smith Premier used by Baden-Powell during the siege of Mafeking, and on the other side is a machine of the same make which was on the *Maine* when she was blown up in the harbor of Havana. The Smith Premier, in other words, like the Father of our country, is first in war, first in peace, and first in the hearts of its countrymen.

The Smith Premier, in addition, is a fluent linguist, since machines fitted with Swedish, Prussian, German, Spanish, French, Russian, Greek, Dutch, Italian, Icelandic, and Siamese characters and accents are constantly carried in stock; indeed, this machine is the only one used in Siam.

It is a long step from the first crude, heavy machine built in 1887 to the beautiful white and gold Smith Premiers shown at the World's Fair, the finest and latest product of the new factory. The contrast is just as great between the little building used from 1887 to 1891, which had but 25,000 square feet of floor-space, and a *weekly* output of 10 to 60 machines, and the present Smith Premier factory opened this year, which has 175,000 square feet of floor-space, employs 1,200 hands, and has a productive capacity of 200 machines *daily*.

The following experience will explain, in a measure, the reason for this great growth:

A large user of typewriters was looking over the field, intending to equip his whole establishment with the same make when he found the right one. He noticed each morning his operators laboriously cleaned the type of the machines that he then had with an old toothbrush and a pin. It was slow work, and occupied at least ten minutes for each machine; then, when he came to examine the different makes before purchasing, he noticed that the Smith Premier is permanently fitted with a circular brush which, in fifteen seconds, cleans all the typefaces thoroughly. A rapid calculation showed him that he was paying one high-priced operator to do nothing but clean machines. He equipped his office with Smith Premiers.

This typewriter is equipped with every little device that will save time and trouble; in fact, it will do almost anything but spell and punctuate automatically.

It was the privilege of the writer recently to see a deaf, dumb, and blind boy write on a typewriter. He knew the position of every letter, and since each character that he could use (and a great many more) had its separate key, he was able to rattle a letter off in a wonderfully short time; by feeling, he knew when the end of the line was reached, and drew back the platen. The machine did the rest.

That is an epitome of the Smith Premier machine—if the operator presses the right keys, the machine will do the work perfectly.

It would seem that, in a few generations, the handwriting art will be a lost one, and that children will be taught how to use a typewriter as they are now taught to form letters.

SMITH PREMIER EXHIBIT AT ST. LOUIS

As has been already pointed out, the Smith Premier writes several languages besides English, and special machines are kept in stock for making out bills, writing cards for card catalogues or lists, insurance policies, and now that loose-leaf books are so much in vogue, it can be used to advantage in almost all kinds of bookkeeping as well as for the taking down of minutes, recording of deeds, etc.

A feature of the Smith Premier which is very clearly shown at their exhibit is its long-bearing type-bar—the advantage of this is that it holds the arm carrying the type straight so that the alignment is kept perfect; the advantage of a long bearing on the type-bar of a typewriter is the same as in placing the hinges of a gate far apart; it prevents both from sagging. A removable platen, or printing-roll, an automatic ribbon-feeding device by which a new surface is continually presented, a tabulating mechanism which can be attached at will without affecting the ordinary working of the machine, automatic paper guides, and many other features besides those mentioned above, are peculiar to the Smith Premier.

It is an immeasurable gap between the Egyptian picture writings shown in one portion of the Liberal Arts Building and the clear characters printed by the Smith Premier typewriter in another, and, while the hieroglyphics show a groping for the light, the Smith Premier is typical of the full radiance of twentieth-century civilization and of all that the World's Fair represents.

DOING BRAIN WORK WITH A MACHINE

IN a little enameled-steel case, about the size of a typewriter, in the Liberal Arts Building, are located mechanical brains that never wear out, never make a mistake, require no training, and are always ready for use. This mechanical brain of the Standard Adding Machine can do sums up to and including ten figures (99,999,999.99) much faster than a man could write them down. The parts are so made that they cannot get out of order and make an error, and the material is such that wear is reduced to a minimum. It is impossible within the limits of this article to dissect and analyze the brains of the Standard Adding Machine, but it is an easy matter to show how they are put into operation.

In front of the machine are nineteen typewriter-like keys — ten in the lower row, numbered one to nine inclusive, and one for naught; the second row has nine keys, colored, corresponding to the ruling of a journal page—that is, units, tens, etc., up to tens of millions. These order keys, as they are called, are colored: tens, white; hundreds, red; thousands, white; and millions, red; so it is an easy matter to tell what key to touch. In operation, if the first sum to be added is in the thousands, for instance, the sixth order key is pressed, then the numeral keys just as if one was writing them on the typewriter; as the numeral keys are touched, the corresponding number is printed on a slip of paper, and when the numbers down to the units are written, the machine locks itself, and no more figures can be added to the line—a lever at the side unlocks it, and at the same time pushes the figures just written into view, presenting a fresh surface for the next line. This operation is repeated until all the numbers have been listed (a much quicker proceeding, by the way, than writing), when the pressure of a lever on top adds the whole column, and prints the total in clear letters at the foot of the column.

STANDARD ADDING AND LISTING MACHINE

The action of the Standard is positive; it is a matter of gears, and it cannot help adding correctly any more than the crank of an engine can help moving when the steam pushes the piston forward.

It sometimes happens that the operator, being merely human, makes a mistake and touches the wrong keys—to correct mistakes, an error key is provided that nullifies it.

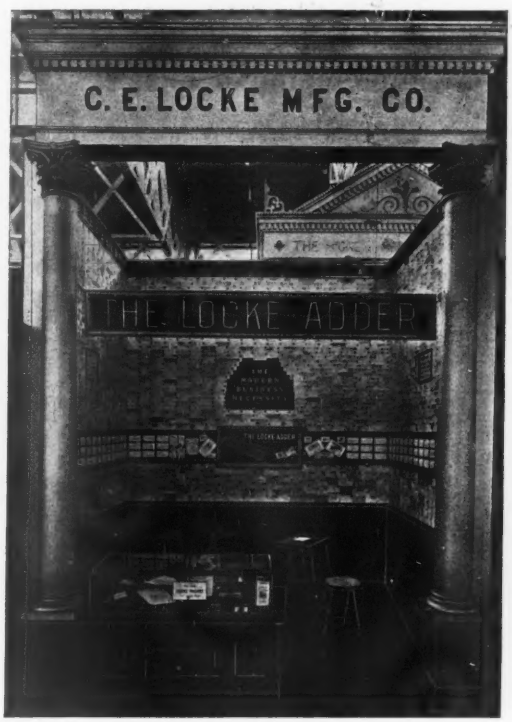
The Standard Adder writes down the figures in plain sight as it goes along, so that, if the operator is interrupted, he can easily see where he left off. The light weight of the Standard (about forty pounds) makes it easy to move from place to place, and, since it will do its wonderful work in any position, it can be set wherever convenient—on table, desk, shelf, or even attached directly to the wall, if that rather inconvenient position be necessary.

Machines that save manual labor are admirable and necessary, but a machine that will save brain work and nervous force is, in the long run, a positive life-preserver.

Much special machinery has been designed and installed in the Standard Adding Machine Company's factory on Spring Avenue, St. Louis, which is said to be the largest, best-lighted, and best-ventilated and most convenient adding-machine factory in the world. The special labor-saving machinery used by which the parts are made, the careful management, but, above all, because of the simplicity of the machine itself, enables the company to charge but $185 for the Standard.

DRUDGERY TURNED INTO PLEASURE

THERE is an exhibit in the Palace of Liberal Arts that is very illuminating and suggestive. The three sides of this booth, from the three-foot-wide wainscott to the top of the thirteen-foot-high partitions, are covered with envelopes addressed to C. E. Locke Manufacturing Company, 74 Walnut St., Kensett, Iowa; envelopes in which were orders for Locke Adders. Many of these envelopes are postmarked with the names of places so remote that one wonders how they ever heard of this little adding machine. There are letters from Honolulu; from Sidney, Australia; from Cape Town, South Africa; and from Vladivostock. One can picture the fur-clad Icelander, the bearded Boer, the cotton-draped East Indian, or the trim, alert Japanese sending to Iowa for the Locke Adder, and the aid it gives them in their work—the language of figures being the same in practically every country.



THE LOCKE ADDER SURROUNDED BY LETTERS FROM ITS ADMIRERS

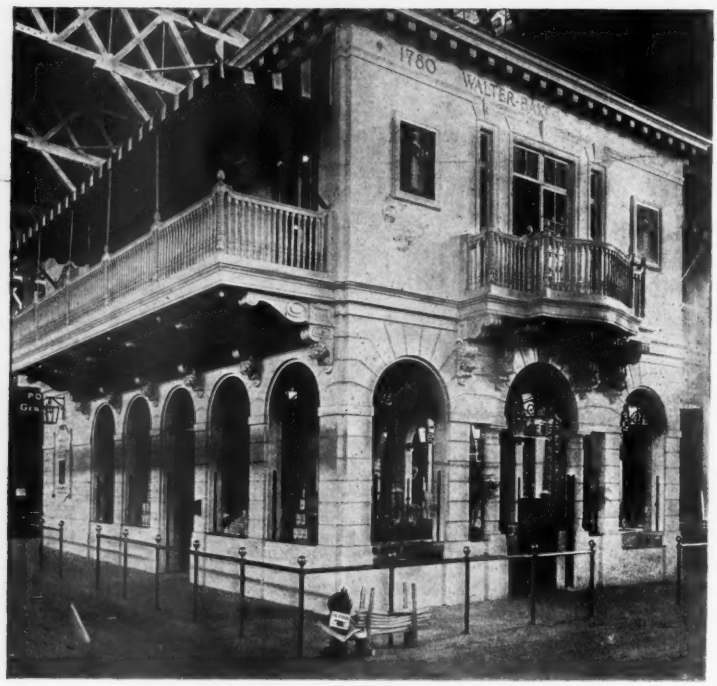
The Locke Adder is about as large as a legal-size envelope, and a half-inch thick. It is made of metal, and is so light that it can be carried in the breast coat-pocket with perfect convenience. Like many other great inventions, this little calculating machine is so simple that one wonders why it was not thought of long ago. It consists essentially of a case in which are set a series of parallel bars, the central portions of which are exposed and bear the numerals 1 to 9, while the ends are covered by plates. In the grooves between these guide bars are nine hollow aluminum bars bearing upon their top surface little knobs corresponding to the figures on the guide bars. These movable bars work freely in the grooves, and the most surprising operations are performed by simply resting the fingers on the little knobs and moving them back and forth. The capacity is 999,999,999, and all columns are added at once. The machine is not limited to Addition, as it is also used for Subtraction, Multiplication, and Division. The Locke Adder, about the size of the average blotter, is a great convenience when a long column is to be added, for the machine can be laid on the ledger page, or sheet, and each line of figures uncovered as it is added to the preceding line. The machine, by reason of its convenient size and low cost, has been found of immense value where a portable appliance is necessary, such as engineering in the open.

Another device shown by the C. E. Locke Manufacturing Company is an adjustable table that, by means of a specially designed clamp and a universal joint, can be secured to almost any surface, desk, easy-chair, wall, or bed. It is a simple little table, with a great capacity for convenience, since the uses for which it is available are without number.

Considering the wide uses of the Locke inventions, therefore, it is not surprising that it is possible to cover the walls of their booth with envelopes containing orders, and still have many thousands left over.

THE CHOCOLATE STANDARD IN THREE CENTURIES

TWENTY-TWO acres of the products of the earth, stretched along nine miles of aisles, is the story in brief of the enormous building devoted to agricultural products. The latest cereal, and the chocolate that has been the standard for more than a century, are there; and besides, there are many interesting processes for making and distributing food. They all have the human palate for their objective. How Epicurus or Savarin would have shouted for sheer joy at the wide array, gathered from every corner of the earth, of delicious things to eat.



THE WALTER BAKER EXHIBIT

If they could visit the Exposition, they would find a building in the pure Colonial style, two stories high, as the home of the Walter Baker Chocolate. Nothing more artistic is to be seen in the entire Department of Agriculture. Without ostentation or undue ornament, the chaste simplicity and consistent execution of design command admiration. The building is pure white, with the relief designs delicately tinted in pastel shades. A large panel on the outer wall bears the name and trade-mark, lighted by an old-time swinging lantern. Large lanterns of wrought iron hang between the entrance arches, and graceful balconies with turned railings curve outward from the upper story. Within, the building is spacious and well ordered. At one side of the entrance is the exhibition-room, where the various chocolates and cocoa made by this well-known firm are shown and sold. In large glass jars are displayed the raw material from which these goods are made, beginning with the great cucumber-shaped

THE INTERIOR SHOWING CHOCOLATE MACHINE MODEL

cocoa pods, and continuing through the beans, shells, cracked cocoa, and the cocoa butter, down to the finished products—the finely powdered cocoa, and the chocolate unequaled for smoothness, delicacy, and flavor. Large bags of the different varieties of cocoa beans are also shown. At the left of the main doorway is the lecture-room, where Miss Burr, of the Boston School of Domestic Science, lectures each day on scientific cookery as applied to chocolates.

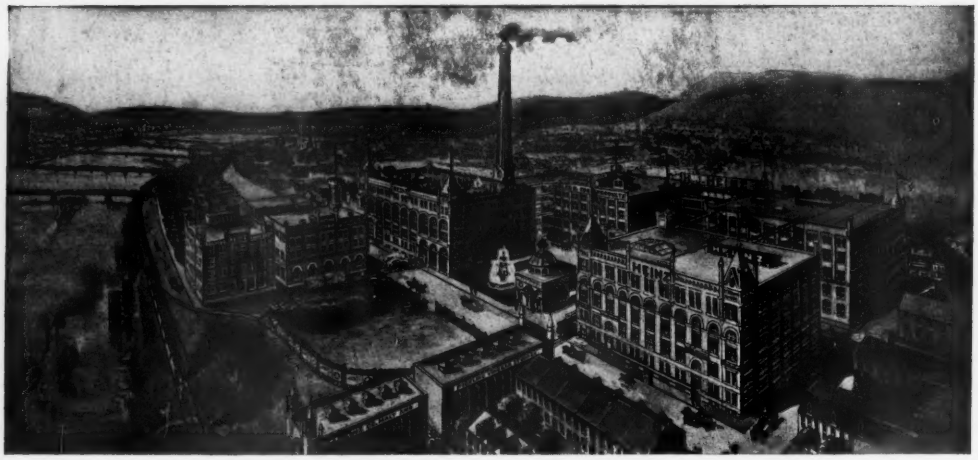
The feature attracting most attention is the complete working-model of the chocolate machines shown in the centre of the main floor. This model, made in Germany expressly for this Exposition, is run by its own little motor, and shows the process of chocolate-making from the time the raw beans come into the factory. First is the roaster, then the winnowing machine, in which the husks are removed, the grinders which reduce the beans to a semi-liquid state, the melanger, and the rollers. The noisy little shakers jolt the soft chocolate into shape, and the bolter drives the cocoa through fine cloth till it reaches the evenly powdered condition with which we are familiar.

A beautiful stairway, in the genuine Colonial style, with mahogany hand-rail and curving banister, leads to the upper floor. This is lighted by a dome and by French windows opening on the balconies, from which an excellent view up and down the great Agriculture Building is obtained. The greater part of this second story is occupied by the pleasant serving-room, where Baker's vanilla chocolate and cocoa are served at little tables, by girls clad in the bright and becoming costume of the famous trade-mark, "La Belle Chocolatière." Palms and old-fashioned rush-bottomed chairs and settees help make this room homelike. A genuine antique is the fine mahogany clock at the head of the stairs. This clock, 150 years old, was made on the Island of Jersey, and, with its quaint brass knobs, hand-wrought case, and brass weights, well repays inspection. In one corner of the second floor is the kitchen, immaculate with white paint and burnished copper urns, in charge of Ben, a colored chef, who has been with the company a dozen years.

The Walter Baker display is marked throughout by good taste, thoroughness, and a constant carrying out of a well-defined purpose and design. This same thoroughness and care for detail are noticeable in the great factories in Dorchester where the Walter Baker chocolates are produced. There, on the banks of the Neponset River where the first Baker mill stood in 1780, stand the great buildings where the most modern principles and methods of chocolate manufacture are put into practice. There floor after floor is given up to the big machines whose little models are shown in St. Louis, and the same scrupulous cleanliness, care, and skill are practiced that are indicated in this exhibit.

For a century and a quarter, the Walter Baker chocolate and cocoa have been the standard, recognized from one end of the country to the other, for genuine worth and purity—a reputation which is well maintained by their wholly appropriate and worthy exhibit at the Louisiana Purchase Exposition.

HOME PLANT OF H. J. HEINZ COMPANY, PITTSBURG



NATIONAL EXHIBIT OF THE "57"

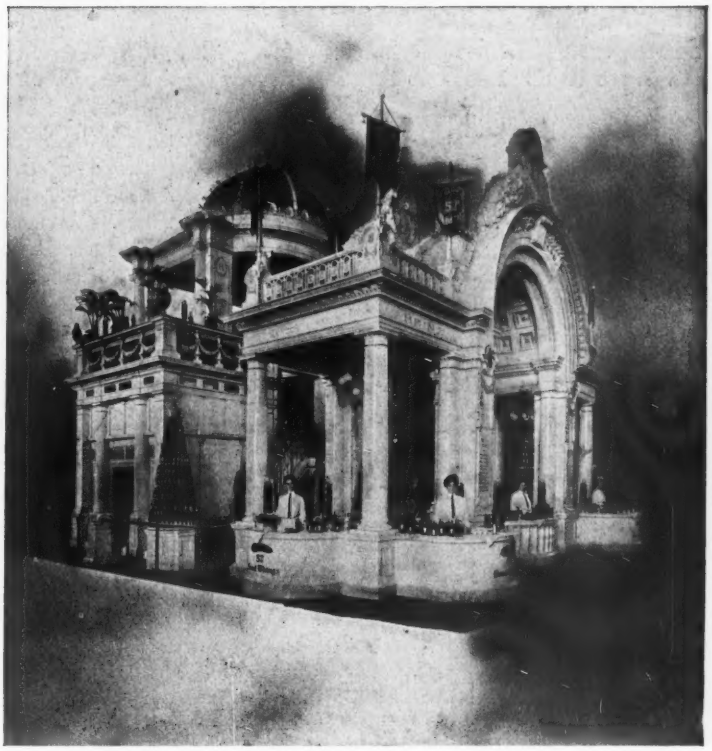
FROM one ocean to the other stretch the exhibits of a famous producer of pure foods. This is the widest sweep, geographically, represented by any exhibitor at the Fair. In ten different State exhibits, from New York, on the east, to Iowa, on the west, and as far south as Virginia, you will find some of the products grown for the H. J. Heinz Company, manufacturers of the famous "57 varieties."

To foreigners, in particular, who are trying to find the reasons for the marvelous industrial expansion of America, this nation-wide basis for a great business is extremely interesting. And it is quite as interesting to Americans themselves, for in it they find another evidence of dauntless American enterprise coupled with wise foresight. These are the things, the forces behind the exhibits, that are, after all, more impressive and significant than all the bewildering displays at the Fair and all the great Exposition palaces.

These ten Heinz exhibits, in ten different State sections, showing the products that come from each State, make a broad national arch, and it has its keystone of architecture in a beautiful gold-and-white pavilion in Section 108 of the Agricultural Building. Coming in past the big horticultural clock, and turning into the broad right aisle, one will see electric bulbs outlining a pickle—that is the cheering sign of the "57." It hangs out from the side of a graceful tower, shining a welcome to the thousands who come to see the twenty-two acres of food-products roofed over in this monster building. Below the sign are four revolving pyramids of Heinz products. As they turn, with the light of 200 electric bulbs shining on them, besides the delight, one recognizes one after another of the familiar and famous "57." There is also a fifth pyramid in the centre of the exhibit, which is stationary, and about which the others revolve, making a wonderfully striking effect.

These whirling, kaleidoscopic invitations, having such a well-known name to conjure with, are heeded by thousands. At the exhibit, many of the Heinz products are served as samples, and dainty souvenirs are bestowed.

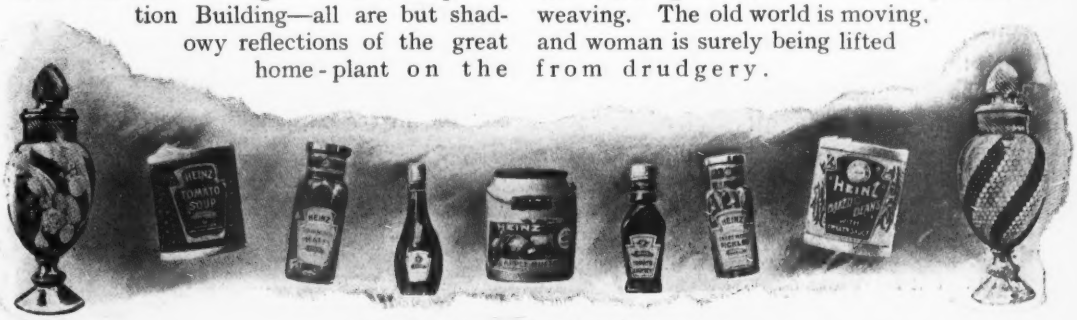
This personal note of hospitality and good feeling finds a broad and hearty response, and the exhibit is swarming with people all the day through. Much interest is taken in the colored stereopticon views which are shown in the little auditorium below the tower of the pavilion. These illustrate the broad sociological work carried on in the great home-plant of the company, at Pittsburg. The close heed paid to these views by all sorts of people reveals how widespread the interest is in welfare work.



THE PRINCIPAL HEINZ EXHIBIT—AGRICULTURAL BUILDING

When visitors see this broad human quality, which has resulted, naturally, in an extremely efficient and loyal body of employees, and also note the broad basis on which the business has been built, there is no surprise manifested when they read, in a panel of the exhibit, that the H. J. Heinz Company has grown until it has over 3,000 employees, 450 salesmen, sixteen acres of floor-space in the great plant at Pittsburg, ten branch factories, twenty-six branch houses, and sixty-one salting stations. And the great display of medals—the Heinz Company has always received the highest medals from expositions throughout the world whenever it has exhibited its products—is accepted as a matter of course.

But the ten exhibits in the various State sections, the large pavilion just described, the novel tank-car of vinegar in the Transportation Building—all are but shadowy reflections of the great home-plant on the banks of the Allegheny. There, in the shining cleanliness of everything and everybody, one sees just such a wholesome place as he likes to think about in connection with what he eats. Long since, the Heinz plant became known as "a clean spot in Pittsburg," and, in its spickness, it is precisely like the kitchen of the neatest home, magnified many thousandfold into a great kitchen for the world. And that is really what the plant of the Heinz Company is. It saves the housewives the trouble of putting up their own fruit and vegetables, and pickles, just as the factory saved their grandmothers the heavy work of weaving. The old world is moving, and woman is surely being lifted from drudgery.



WHITE ROCK THE NATIONAL BEVERAGE

THE American, when he goes abroad, has been made a laughing-stock by his English cousins and his Continental friends because of his insatiable desire for water pure, undefiled, and ice cold. The American's call for water is as insistent as a German's for beer or an Italian's for wine, and is so universal as to amount to a national trait. Though no American Omar Khayyam has yet arisen to write a Rubaiyat on water instead of wine, the praises of one spring of water undefiled have often been sung.

In the days of long ago, when the Indian's happy hunting-ground was on this good earth, he built himself a platform of boughs in the oak trees overlooking a pool of clear water that gushed out of a white rock, and, when the deer came to drink, he filled his larder. Later, perhaps, the earliest American realized that the water was too good for the wild animals to enjoy exclusively, and began to drink it himself. At any rate, Indian trails from all directions focussed at White Rock Spring, and men in increasing numbers have been drinking it ever since.

At the foot of a high cliff-like hill, snow-white and glittering in the sun, a stream of water wells out in a steady, even flow, as pure and clear as the rock from which it comes; this is White Rock Spring, from which comes the sparkling national beverage seen in all parts of the land and across the seas.

THE WHITE ROCK EXHIBIT

Nestling under the white rock hill, and set among the very grove of oaks from which the Indians watched their prey, are the bottling works of the White Rock Mineral Spring Company. The company has bought the land for some distance all around the spring, in order to prevent pollution, and the same care is taken to keep out the most minute defilement during the bottling process. The bottling works are kept antiseptically clean; the workmen are required to wear white duck suits and follow the most exacting rules regarding personal cleanliness; the bottles, corks, and apparatus are carefully sterilized. To make assurance doubly sure, the Wisconsin State chemist makes a bacteriological examination of White Rock every month. All this is done to make sure that the virgin purity of the water is not impaired. White Rock Water, therefore, reaches the consumer as pure as when it flowed from the white cliff.

The familiar trade-mark of White Rock Water, "Nature's Mirror," has been reproduced three-quarters life-size in pure silver, and all day, and every day, in the Agriculture Building at the World's Fair, the silver figure of Psyche gazes into the clear water, lost in admiration of her lovely reflection. In the Wisconsin Section, in the same building, a pyramid of bottles of sparkling White Rock is shown, and the thirsty throng surge by an exhibit of the same kind in the Mines Building, longing, as they pass, that the bottles would break so that they might be refreshed.

White Rock Water has become the national

ROWS OF WHITE ROCK, THE NATIONAL BEVERAGE

beverage, for more of it, both sparkling and still, is sold in this country than any other bottled water. But still the demand grows, as is shown by the fact that the increase in sales in 1897 over 1896 was 25 per cent.; the increase in 1903 over 1902, 47⅔ per cent.

Many people know White Rock only as a table water, in which capacity it is unexcelled by any water in this or any other country; its softness, its refined flavor and combining qualities explain its popularity. Others, strange to say, know White Rock only for its curative qualities, since, through its eliminating, tonic and digestive qualities, it has commended itself to them.

The sale of this water far exceeds that of any foreign water in this country, and it is interesting to see what its experience was during the Paris Exposition, in 1900. The official jury examined, analyzed, tested, and tasted all the waters submitted to them, each brand being marked with a number, known by the secretary only. At the end of the examination, the competing brands were divided into five groups, according to their excellence; one to four was considered ordinary; five to eight, fair; nine to twelve, good; thirteen to sixteen, very good, and seventeen to twenty, perfect. White Rock was the only brand to get into the seventeen to twenty class and receive the "perfect" mark. Out of the twenty-one brands submitted, no other reached as high as sixteen. So White Rock Water won the gold medal, and was pronounced perfect by the French government chemists, and the American people, whose national beverage it is, have put the stamp of their approval on the spring that has flowed from the white rock as far back as the mind runneth.

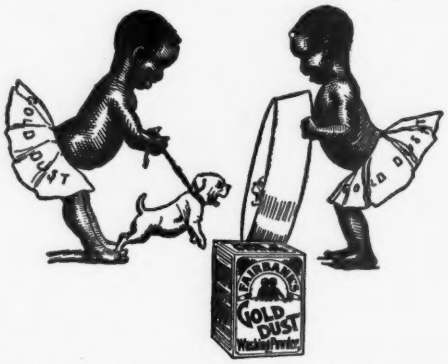
The beautiful little city of Waukesha, Wis., has been built over the Indian trails leading to the spring, but, as the bottling of White Rock Water is the chief industry of the town, the silent, clear crystalline spring—the very epitome of purity—still dominates the town.

THE FOUNTAIN WITH THE TWINS

IT was a visionary scheme which brought Ponce de Leon to this western country in search of the magic fountain, and he was compelled to return to Spain in disappointment. He was a few centuries ahead of his time. Had he lived to this day he might have seen his coveted Fountain of Youth materialized at the Louisiana Purchase Exposition. The Fairy Soap Fountain, it is called, and it is the central feature of the N. K. Fairbank Company's exhibit in the Liberal Arts Building. At first glance, it is difficult to believe that this delicate object is produced by an agency so material as soap. The fountain consists of a great column of filmy, glistening soap bubbles, continually rising from the base and falling in a gleaming mass to the two basins below. From the floor to the top of the column is a distance of twenty-two feet, and the fountain is surmounted by a graceful white figure of a fairy, more than five feet in height. The fountain arouses great surprise and admiration among the Exposition visitors, who comment freely on its originality and beauty. It is operated by electricity, and has a patented bubble-blowing device, by which over a million bubbles are produced in an hour's time. Large and effective as this fountain is, it takes only three-quarters of a pound of Fairy Soap to keep it running for two days, but it justifies its title to the Fountain of Youth by the purity and wholesomeness of its source, Fairy Soap, whose use so competent an authority as Lily Langtry recommends for preserving youth and beauty.

No less attention is attracted by the wonderful fountain than by the famous Gold Dust Twins, here present in the flesh in the persons of two little darkies who hand out booklets to the amusement of their many friends. It is sad to relate that the first pair of twins failed to live up to the reputation attained by the familiar advice, "Let the Gold Dust Twins do your work." So far were they from doing your work, or their own either, that they played craps and indulged in fisticuffs till they had to be ejected, and a more domestic and tractable pair substituted. Not only are the busy twins present in person, but statuettes of them decorate the booth, depicting the twins clad in red and blue skirts and occupied in washing clothes, juggling platters, and cleaning the clock. The booth, done in white and green, has an effective display of Gold Dust and Fairy Soap in square glass pillars about the exhibit

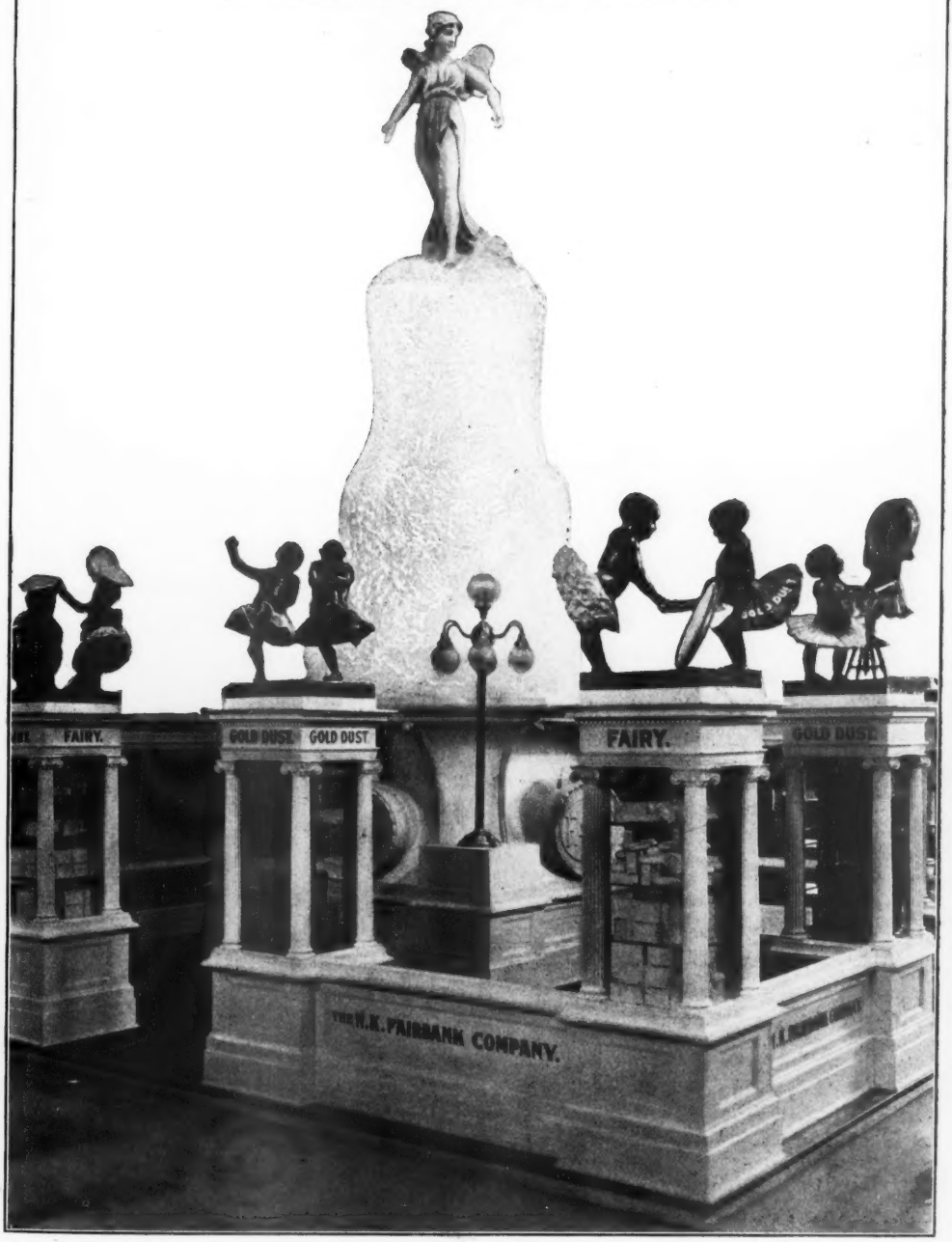
Another well-known product of the N. K. Fairbank Company has its local habitation in the Agriculture Building. This is the Cottolene exhibit, and it is appropriately situated in the big cotton section in the central part of the building. The exhibit represents a Model Kitchen, and is all in green and white, from the linoleum on the floor to the very cooking utensils. Miss Nelly Worcester, of the Boston Cooking School, demonstrates the uses and virtues of Cottolene to large numbers of appreciative visitors. She and her assistants wear the Cottolene colors, white and red. Leaded-glass dish-cupboards, plate-rails, a porcelain refrigerator, and a large gas-range comprise the furnishings of this attractive booth. There is a storeroom and a drying-room connecting with it. On a double



counter in the centre are displayed sundry viands, such as doughnuts, cheese-straws, tarts, cakes, and Saratoga potatoes, all cooked with Cottolene and extremely appetizing.

When a clever mind conceived the idea of the Gold Dust Twins there was produced a source of amusement for thousands whose daily rides in cars or ferries

FAIRY SOAP
BUBBLE FOUNTAIN

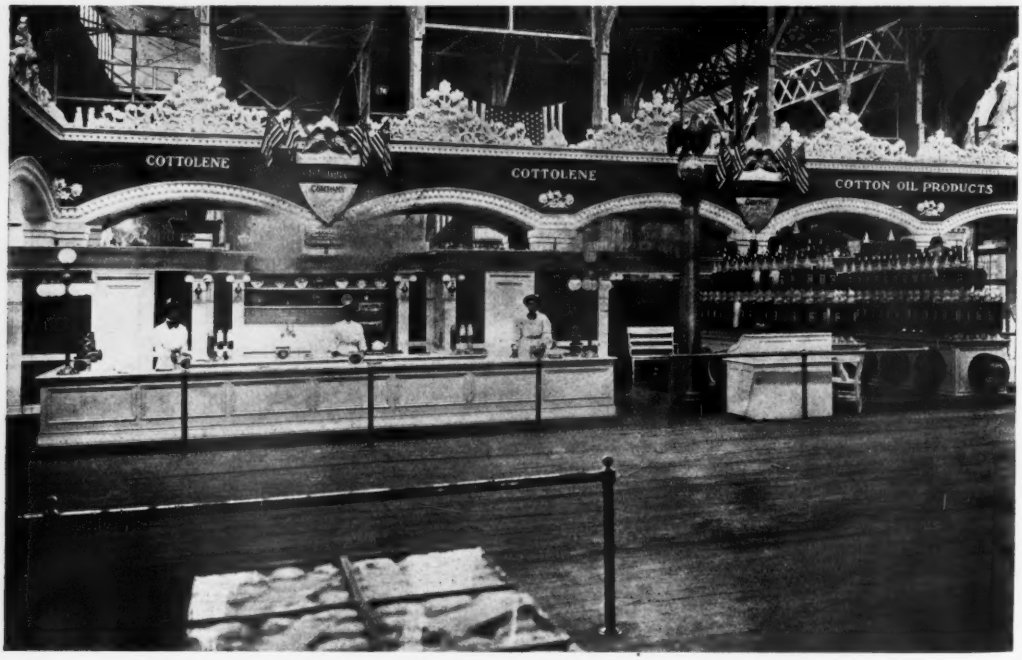


THE FOUNTAIN OF THE FAIRY AND THE TWINS

lead past great billboards, on which disport the jovial twins. In whatever occupation they are depicted, these ubiquitous urchins, with their inimitable poses and their irresistible good humor, are seen turning work into play. This is just what is claimed for Gold Dust itself—that it takes away drudgery and makes the labor of washing, cleaning, and scrubbing so light and easy that it becomes a pleasure. The friendly little figures stand for a friendly household ally, as will be easily seen by "Letting the Gold Dust Twins do your work."

As for that familiar query, "Have you a little 'Fairy' in your home?" it is doubtless answered in the affirmative by thousands of those who, trooping through the big Liberal Arts Building, view the wonderful Fairy Soap Fountain. For, as a pure white soap, invaluable for the toilet, bath, or laundry purposes, Fairy Soap has won its way and reached an enviable position.

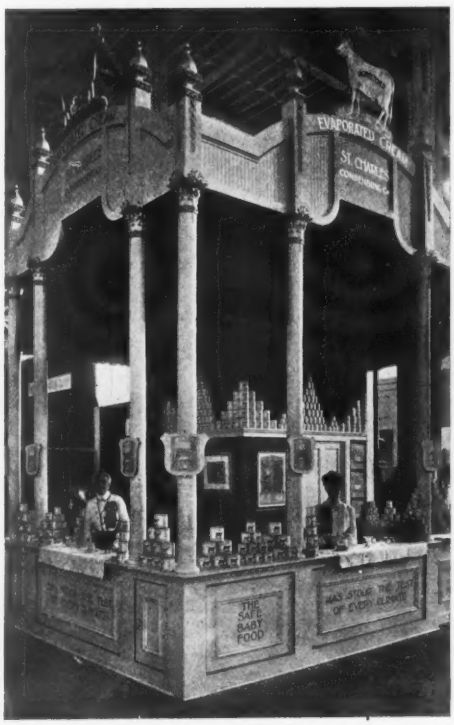
What Gold Dust and Fairy Soap are to the other departments of housekeeping, Cottolene is to the cook. In convenience and attractiveness it is well worthy of its companions among the Fairbank products. It is now more than a dozen years since Cottolene was put on the market as a substitute for coarse animal fats, such as lard, and it is natural that, in that length of time, there has been advance and improvement in its manufacture. The white Cottolene, put up in shining tin pails with white and red labels, is both attractive to the eye and palatable in cookery. Made of pure cotton-seed oil, it makes a very practical and satisfactory article for shortening and frying purposes, and is recommended by physicians, food experts, and cooking authorities. Their indorsements are given in the little book, "Home Helps," a useful volume of recipes, edited by the famous cooking-teacher, Sarah Tyson Rorer.



THE N. K. FAIRBANK CO AND AMERICAN COTTON OIL CO. EXHIBITS IN THE AGRICULTURAL BUILDING

AT THE SIGN OF THE GOLDEN COW

A GOLDEN cow surmounts a corner booth in the vast Agricultural Building at St. Louis. Unlike the golden calf of Biblical times, which produced trouble and discord, this placid bovine stands for peace and comfort, for it is the trade-mark of the St. Charles Cream. The dainty white-and-gold booth displays pyramids of the little cans of cream and many tiny statuettes of the gilded cow. Shields on the pillars supporting the roof show facsimiles of the can, and dark-red hangings and green walls lend a touch of color to the general effect. Cream is served at the counter in little glasses, and puzzles given to interest the children. A list of awards is displayed, showing that the St. Charles Evaporated Unsweetened Cream has received highest honors over all competitors wherever shown, including the expositions at Chicago, Paris, Omaha, and Buffalo. Long ago, it was awarded high honors by its loyal friends for its purity and palatableness. Physicians and nurses recommend it, children thrive on it, and, for the household, its uses are manifold, since, by the addition merely of water, it becomes a fluid milk. Being thoroughly sterilized, and handled throughout every process under strict supervision, it avoids the dangers lurking in the use of ordinary cows' milk, which is subject to germs of tuberculosis and other diseases. Children, especially, are susceptible to intestinal troubles caused by impure milk. As an evidence of the regard in which physicians hold the St. Charles Cream, it is worthy of note that it has been used for many years at the Chicago Foundlings' Home and many other large institutions for the care of children, with most gratifying results. For culinary purposes, St. Charles Cream fulfills every requirement of common cream or milk, and is preferable, being absolutely pure, which cannot always be said of the fresh product. It is especially nice for custards, puddings, soups, ice-cream, and confectionery, besides its ordinary use in tea, coffee, cocoa, and as a dressing for fruits. The St. Charles Cream being unsweetened, it can take the place of fresh milk or cream for drinking or cooking. Its advantages in the matter of convenience are readily apparent. It is always ready and never fails, rendering the housekeeper independent of the milkman, with no greater expense than the usual milk-supply entails. St. Charles Cream is prepared from milk produced by selected cows, scientifically fed on model farms in the finest dairy sections in the world, surrounding St. Charles, Ill., and Ingersoll, Ont., under direct supervision of the company's inspectors, the most scrupulous care being exercised at every step. The milk is reduced to the consistency of cream by evaporation in vacuo; it is then canned and preserved by a perfect process of sterilization.



ST. CHARLES CONDENSING CO. EXHIBIT

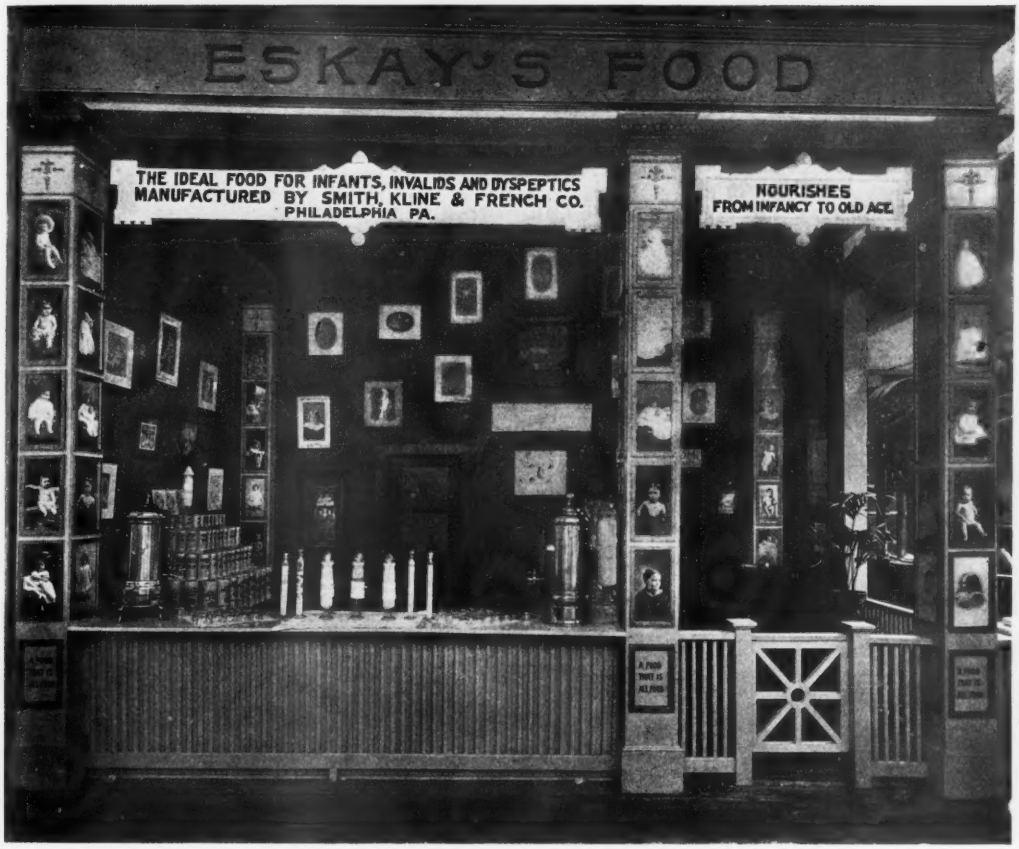
RATIONS AT THE MODEL PLAYGROUND

NOT an unimportant part of the World's Fair city is the Model Playground, one of the exhibits on the model street. Here children are taken care of while their mothers go sightseeing—a plan that is a boon to the mothers and a delight to the children. The Model Playground is, at the same time, an object-lesson of how a playground and day nursery should be conducted, since educators and those interested in the welfare of city children can see, in actual operation, an ideal playground, and witness the zest with which the youngsters enter into the games and pleasures. The most modern and approved methods are followed, and the best apparatus is installed; the children are fed only on food that has the unqualified approval of the doctors. It is a sight that is worth a long journey to see the joy with which the children enter into the games provided for them. Their active play in the sand-piles, the smooth grass, or the swings create splendid appetites, and the eagerness with which they take to their rations of Eskay's Food is good to see. Eskay's Food has been chosen to the exclusion of all others, because the authorities have decided that it is best fitted for the nourishment of infants, and no other prepared foods will be given the babies unless the mothers absolutely insist upon it. It is an interesting and significant fact that this Playground and Day Nursery, designed to serve as a model for the whole country, should select Eskay's Food as standard.

CHILDREN OF ALL NATIONS GATHERED AT THE MODEL PLAYGROUND

It was the writer's privilege to be present at the opening reception of the model playground, where the children of all nations were gathered together. The Esquimau was most friendly with the Turk, and the little hairy Ainu child played contentedly with the Indian children of our own plains. Chinese tots trundled American hoops, and Egyptians swung delightedly upon gymnastic apparatus made in New York.

One of the triumphs of modern medical science is the successful use of the baby incubator, and with this great humanitarian work Eskay's Food is closely allied. These incubators in use may be seen at the Model Playground. The white-robed attendants will tell you that 85 per cent. of the babies brought up for a time in incubators are saved to grow up to be lusty children. The next stage from incubator is the nursery. Some of the babies in the nursery at the playground are fed on Eskay's Food. The fact that Eskay's is given to the child at one of the most critical periods of its life, when it is really living under natural conditions for the first time, forms the real hygienic value of the food.


ESKAY'S FOOD
THE IDEAL FOOD FOR INFANTS, INVALIDS AND DYSPEPTICS
MANUFACTURED BY SMITH, KLINE & FRENCH CO.
PHILADELPHIA PA.
NOURISHES
FROM INFANCY TO OLD AGE

WHERE PEOPLE OF ALL NATIONS ARE SERVED WITH ESKAY'S FOOD

In the Agricultural Building, another phase of Eskay's Food's usefulness is shown. In their booth, lined with pictures of laughing, plump children, Messrs. Smith, Kline & French serve Eskay's Food as prepared for adults. It is interesting to note the expressions of the people who stop to taste the food: they begin with an air of resignation, as if they were taking a dose of medicine; they end with expressions of surprised enjoyment, for Eskay's food tastes good. It has a wonderful upbuilding effect on grown people, and is often prescribed for the convalescent, the weary, the aged, and for those who wish to gain weight.

Eskay's Food is composed in part of wheat barley, and oats, carefully selected, and so prepared as to act as an attenuant of the tough, cheesy curds which are found in cow's milk, and to change them into smooth and flocculent curds, the same as found in mother's milk. Then the manufacturers add the egg in combination with sugar of milk, which latter preserves it, and this is so finely powdered as to be readily held in suspension and easily acted upon by the fluids of the stomach. This, together with the sugar of milk, supplies a modifier of cow's milk, furnishing the tissue-building element, and the heat- and energy-producing element in such proportions as to supply perfect nutrition, not only for the infant, but for the invalid.

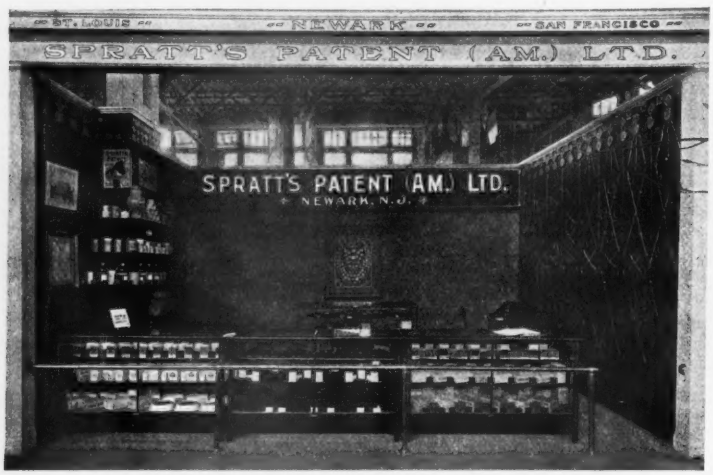
One needs but to compare this Food with the other infant and invalid foods served at the World's Fair to detect its superiority. If any further evidence of its adaptability for the purpose for which it is recommended were needed, it is furnished in the pictures of actual Eskay's Food babies shown in the booth, representing the results of its use in well-fed, well-nourished, and perfectly healthy and happy babies.

WHAT TO FEED YOUR DOG

THERE is one spot in the Forestry, Fish, and Game Building which no dog-lover can go by without pausing; and, judging by the number of people who do stop at "Spratt's" booth, the majority of World's Fair visitors count at least one dog among their friends.

The name "Spratt" is almost as familiar, the world over, to owners of dogs as "Setter," "Collie" or "St. Bernard," and the quality of the biscuit bearing that name is as widely recognized.

The booth of Spratt's Patent (America) Limited is walled at the back with the famous dog-cakes, and the arrangement, besides being most effective, is very pleasing; the light-brown of the square tile-like biscuits, each bearing the name stamped on its surface, harmonizes with the work of the other exhibits, and sets off to advantage the frame of medals obtained at expositions all over the world. On the other walls are hung leads of leather and metal, collars gorgeous and simple, large and small, while carrying-cases and every imaginable thing that the mind of a dog-lover could conceive are at hand in show-cases or neatly arranged about the enclosure.



THE SPRATT EXHIBIT INTERESTS DOG-LOVERS

Spratt's Limited is an international institution, having factories in Europe as well as in America, though the inventor of "Spratt's dog cakes" was an American citizen.

A tyro in dog-lore will have no conception of the number and variety of articles devoted to the noblest of animals until he has visited this exhibit: Combs made in various shapes and materials, brushes, blankets, towels, food and water dishes, whips, chains, gloves used in grooming the dog, books on the care of dogs and other pets, and many other things.

It has been said that Spratt's Patent (America) Limited can supply any dog need, no matter what it is, and the writer has never heard of a case when this claim was not substantiated.

Food suited to the needs of other pets, both furred and feathered, is an important part of this firm's large business; in fact, it would be well to inquire of "Spratt's" first for any need for any pet.

"Spratt's Dog Culture, with a Chapter on Cats," is the title of an interesting little pamphlet that will be presented to you at the exhibit, or sent on request to the home office of Spratt's Patent (America) Limited, Newark, New Jersey.

This company is the largest contractor and purveyor for dog and poultry shows in every part of the world, and to enumerate the great exhibitions fitted up by them would take many pages of this book. Suffice it to say that they are invited to fit up the dog and poultry shows in connection with this present World's Fair.

Of course Spratt's Patent do not confine their attentions to the dog; all domestic animals receive their attention, and, besides a very large business in poultry and game foods, they make foods for rabbits, cavies, song-birds, aquarium fish, cats, and pigeons.

Almost every Polar Expedition, Arctic or Antarctic, has taken a large supply of Spratt's dog-cakes, and some of these biscuits have been to very high latitudes indeed.

THE EXHIBIT OF THE WILKE MANUFACTURING CO

REFRIGERATING PLANTS FOR HOMES

WHEN the writer visited the Wilke Manufacturing Company's exhibit in the Agricultural Building, it was a very warm day, the attendant was engaged in another part of the space, and the Brunswick refrigerating machine was running unnoticed in the corner, inclosed in glass—noiseless, yet on the expansion pipe there was a coating of frost a half an inch thick, and the interior of the refrigerator, of which the machine was a part, was positively Arctic.

It is the function of this machine to produce cold, not ice; the air constantly being changed is kept cold, so that the contents of the refrigerator are kept in a perfect state of preservation without coming in contact with any ice. Ice, however, can be made in a tank provided for the purpose.

Heretofore, it has been impossible to make mechanical refrigeration machines of small capacity—only machines that were suitable for great establishments, utterly beyond the requirements of an ordinary household,

The connection of the Brunswick machine with the Wilke refrigerator makes an ideal combination, as the Wilke refrigerator is as far in advance of other makes as the machine is in its line.

These refrigerators are famous for their sanitary glass and porcelain linings, which make them practically glass or china bottles. The sheets of glass composing the linings are set in a peculiar cement that makes the whole compartment practically one piece. Naturally, the value of a refrigerator depends on its being a good non-conductor of heat, and, in this regard also, the Wilke Refrigerator excels; between the inner lining and the outside, a thick blanket of granite-rock wool is interposed—this substance has been found a most efficient insulator and forms a rampart that the heat has great difficulty in penetrating.

In addition to the sanitary and economical qualities of the Wilke Refrigerators, their outside finish is worthy of note. All suitable hard woods, of different finishes, are used, and great care is taken in the selection and preparation of stock, so that, once put together, no cracks or warps will ever appear. The lines of these refrigerators are very simple, so that the entire surface can be easily cleaned. Indeed, so thorough is this company's knowledge of wood-working, and so complete its plant at Anderson, Indiana, that great quantities of parquet flooring are sold every year all over the country.

A number of the Wilke Refrigerators have exteriors of white tile that are most attractive in appearance, and as easy to keep clean inside and out as a china bowl.

First, man set himself to produce heat—for through heat comes power—and then, as he gained in knowledge and understanding, he studied how to produce cold—for, through cold, health is preserved and comfort reached. To the later, higher type of civilization, the work produced by the Wilke Manufacturing Company, of Anderson, Indiana, belongs.

A GREAT EXHIBIT OF FERTILIZERS IN THE AGRICULTURAL BUILDING

AGRICULTURE IN THE NEW SOUTH

IN this and other magazines have appeared many articles showing what the new agriculture has accomplished; how, by improved methods of tillage, fertilization, and harvesting, greater crops are produced at a proportionately decreased cost. The whole vast Palace of Agriculture at the World's Fair is filled with evidences that modern farming is science of the highest kind.

In all the acres of exhibits showing farming machinery and farm products of various kinds from many places, perhaps the key to the whole system is found in the corner devoted to the products of the Standard Guano and Chemical Mfg. Company, of New Orleans. For, no matter how careful the tillage and well selected the seed, the land will deteriorate if as much nourishment is not put into it as the crops take out.

This company has, for over thirty years, been making fertilizers to fit each particular need as it arose, and, by its scientific methods and honest dealings, has built up one of the largest businesses in this line in the country.

In their pavilion in the Palace of Agriculture, the Standard Guano and Chemical Mfg. Company exhibit not only special fertilizers for special purposes, and general mixtures suitable for certain general conditions, but also the various chemicals with which the buyer may form his own combinations.

The researches of this Company have led them to believe that a combination of animal bone and animal matter, from which their goods are principally made, give the best field results, and practical field tests have proven that they are not mistaken. The following, clipped from their "Farmers' Hand Book," is a case in point:

"The proper kind of fertilizer not only enriches the soil permanently, prevents rust and blight, but it strengthens the plant against all of its insect enemies; experience of many of the best planters in the South have proved that, by a judicious use of our fertilizers, from 150 to upward of 400 per cent. increase has been frequently obtained by their use, and no fact more clearly demonstrated than the signal success which invariably attends the use of these fertilizers."

In this connection, it is interesting to note some of the special fertilizers compounded for special purposes by this company:

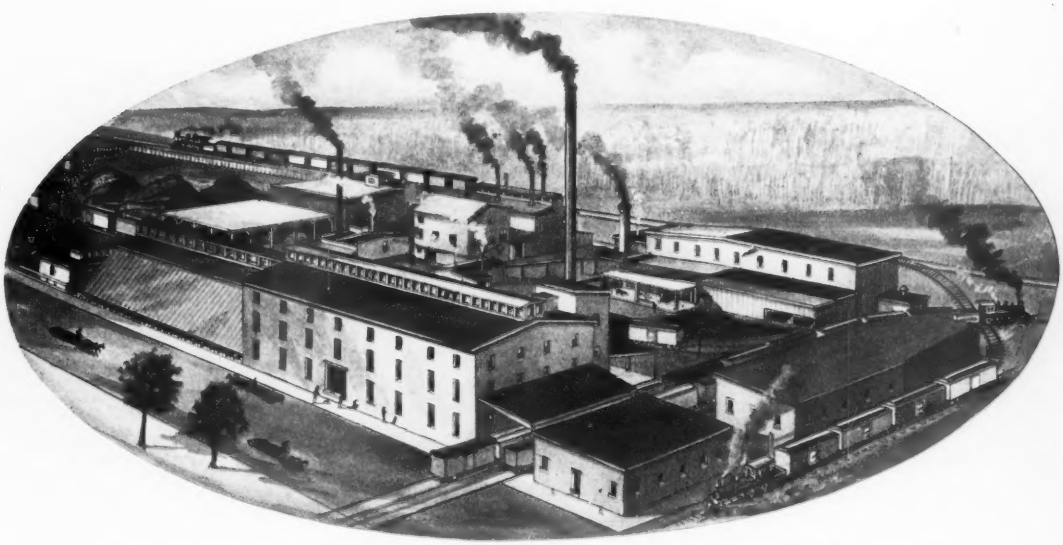
Fertilizer for cotton, high-grade sugar superphosphate for sugar-cane, fertilizer for oranges, rice fertilizer, cabbage fertilizer, tobacco special, strawberry fertilizer, fertilizer for fruit, grape, and nursery stock, and onion fertilizer.

All these fertilizers have been tested by repeated use and have never been found wanting. While the ingredients are well known and in common use, it is the careful selection and combination that makes them valuable.

The Standard Guano and Chemical Mfg. Company have exceptional facilities for the making of fertilizers, and particularly blood, bone, and meat guano, since their close and direct communication with the great cattle-ranges of Texas and the Western States, South and Central America, gives them unusual opportunities for securing raw material at low cost.

The wealth of the United States lies chiefly in the farm products; many nations depend upon her for their supply of grains; her cotton crop is the most important in the world; and her sugar-cane growing is an industry of enormous proportions. With this great success, the Southern States have much to do, and, with the growing up of the "New South," the Standard Guano and Chemical Mfg. Company has been closely identified, and prospered in proportion. Its policy is to keep its property, machinery, buildings, and equipment strictly up to the times, so that a piece of machinery or a process no sooner becomes obsolete than it is abandoned for the newer and more efficient.

The products of this company won the gold medal at the World's Centennial Cotton Exposition, 1884–5, and at the North, Central, and South American Exposition, 1885–6, and, today, its works occupy three city squares, or blocks—nearly twenty acres: the moral is obvious.



PLANT OF THE STANDARD GUANO AND CHEMICAL MANUFACTURING CO., NEW ORLEANS

ROOFING THE WORLD'S FAIR BUILDINGS

THE largest exhibit at the Fair is on the roofs of seven of the great buildings. It is beyond doubt the most useful among the exhibits also, for it protects all the others from rain and sun. This 7,500,000 square feet of exhibit is the Rex Flintkote Roofing, which was selected, after the most severe tests, as the covering for the $40,000,000 worth of property included in the exhibits.

Never before, since men came out of caves and began to build, have there been such mighty stretches of roof spread out under the sky as there are on these World's Fair buildings. It was a problem of great difficulty to find a roofing which could be bent to conform to all the angles of the buildings without cracking; which could withstand the torrents of water rushing down the roofs after rains; which could be so handled as to bring out the full beauty of every tower and dome and minaret, as well as add to the impressive effect of the vast roofs themselves. But Rex Flintkote met all these requirements, and the mighty Vulcan in the Mining Building, the precious stones in Varied Industries, the delicate machines in Manufactures, and the puffing locomotives in the Transportation Building all bear witness as to how well they are met.

THE REX FLINTKOTE ROOFING EXHIBIT

And what is this wonderful Rex Flintkote? That question is asked scores of times every day, as people see the water-drenched roof of the Rex Flintkote pavilion in the Varied Industries Building. Although the water pours on the roofing, all is dry inside the pavilion, just as the same roofing keeps 50,000 different exhibits dry. The Rex Flintkote roofing, which does this, is made from the best quality of long-fibre, selected wool-felt, which is specially treated with water and acid-proof compound. The result is a tough pliable sheet of close texture, which is coated on both sides with waterproof and fire-resisting compounds and then covered with the flint coating. No tar is used in its manufacture, and Rex Flintkote Roofing, consequently, does not run or sag in summer nor become hard or brittle in winter. Its advantages in cost and service are so great that it is fast replacing shingle, iron, and tin roofs. From every compass-point the most unqualified indorsements have come as to the quality of Rex Flintkote. For factories, for residences, for dairy-barns—in fact, for every kind of structure—this incomparable roofing has been used and found equal to every condition of climate and weather. It has been found to be a universal roofing. The makers, J. A. and W. Bird & Company, of Boston, have become not only roofers to the World's Fair, but to much of the rest of the world besides.

THE FLORAL MANTLE OVER GRAVES

NOT far from the main exhibit of The Crane & Breed Manufacturing Company is shown their "Floral Mantle." This is a casket-lowering device which lowers the casket into the grave in a dignified manner and with surroundings of beauty.

If one moment is more full of anguish to the mourners than another, that moment is when the earth begins to be shoveled upon the casket of their loved one. Those who have been through this harrowing experience years ago, say that the sound of the filling in of the grave around the casket is still ringing in their ears. The Floral Mantle is the product of years of thought, having as its object the substitution of a beautiful effect for the crude and unsympathetic present method of lowering the casket.

THE FLORAL MANTLE

On approaching the spot where this invention is in use, one is surprised to see nothing that would suggest the grave. The framework of the machine, inclosing the grave and rising about sixteen inches from the ground, is so draped with green broadcloth and velvet that all suggestion of machinery is avoided. The grave is, of course, hidden; the mound of earth has been covered with boughs of evergreen trees; moreover, the color of the drapery harmonizes well with that of the grass.

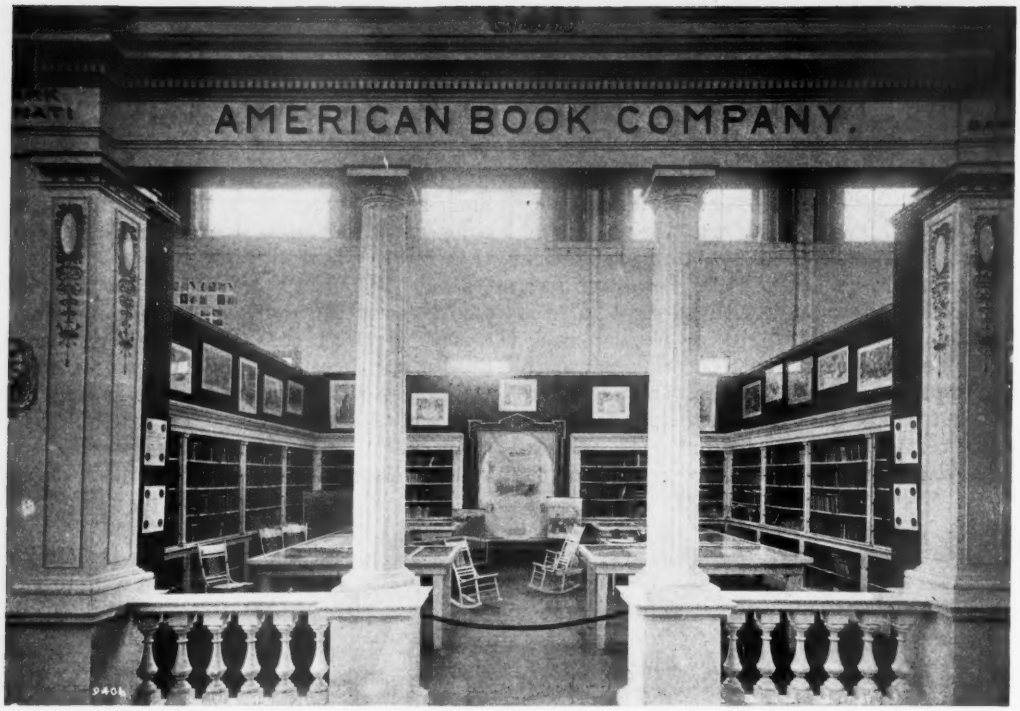
Four strong bands of webbing are stretched tightly over the open space inside the machine. Upon these the casket is placed. Slowly and noiselessly it disappears beneath the green. Soon can be noticed on each side a screen of flowers coming up just inside the drapery. It is worked on the principle of a roll-top desk. The two screens meet, closing the opening completely.

This is the obvious and appropriate time for the family to depart. They now leave, carrying with them the memory of a beautiful tribute to the loved one—nothing to be seen but the harmonious greens round about, and, crowning all, the mound of flowers.

The Floral Mantle is very solidly constructed, enabling it to bear a tremendous weight. Lightness is obtained by the appropriate use of aluminum. Being nearly automatic, little care devolves on the operator. An entirely new feature, immensely appreciated, is the automatic safety catch; this absolutely prevents any loss of control of speed. Screens of artificial leaves can be furnished with the machine to which few or many fresh flowers can be added.

The use of the Floral Mantle will doubtless appeal to the trustees and managers of cemeteries, as it allows of a beautiful close to a beautiful ceremony.

The Floral Mantle can of course be moved from place to place and used as often as desired.



A VAST EDUCATIONAL INFLUENCE

EDUCATION is the bulwark of a nation, the very means to its culture, power, and efficiency. In the stately Palace of Education and Social Economy that rears its shining white colonnades almost in the very heart of the Fair, all nations present their methods of emancipating people from ignorance and of giving civilization a factor more potent than the art of the statesman. But, in this great educational conquest of the world, the educational text-book is mightier than the sword, and among the exhibits of enlightenment and progress, that of the American Book Company stands out with peculiar prominence. Crowning the classic outline of the exhibit is an American eagle. Standing on a globe, with wings outstretched, a fitting symbol of the power and influence of the great business institution represented there.

The American Book Company is the largest exclusive publishers of text-books in the world. The sphere of its influence and useful activity knows no geographical bounds. In the public schools of Japan, in the missionary schools of Turkey, in the educational institutions of South America, indeed, wherever English is spoken or taught, the books of the American Book Company are in use. Many large publishers would be content with the success achieved by the American Book Company in creating for use an absolutely complete line of all kinds of text-books, but, following one of the dominant, as well as characteristic, principles of the establishment, each year witnesses many new and improved additions to the lists. Whether it be Latin grammar, American history, or geography, not one, but many authorities are marshaled, and not one, but many, books on the same subject are offered to the discriminating educator.

Thus, the American Book Company, in an ever-widening and ever-increasing activity, reveals itself not only as a beneficent commercial enterprise, but as a great educational institution.

WHERE WORDS ARE BROUGHT TO BOOK

VISITORS to the classical Education Building at the Exposition will, near one of the entrances, come face to face with an old friend in the familiar person of "Webster's Dictionary." There have been marvelous changes in the American nation in the hundred years succeeding the Louisiana Purchase; in art, business, agriculture, commerce, change has succeeded change, and progress has trodden on the heels of progress, till a retrospect reveals startling differences. In no way, perhaps, have the changes been more marked than in the very language of the people, the gradual alterations which have crept in till we have, in many respects, a new language. The faded old "Webster's Dictionary," which was published early in the nineteenth century, was then thought to be a complete compendium, with etymology and pronunciation, of the words in use in the English language. But, in the busy years following, thousands of new words came into being, to describe the processes and industries, the inventions and discoveries of this restless American nation. And a dictionary to meet the needs of the times must keep step with the language and faithfully reflect its changes. This has been the aim of the publishers of "Webster's International Dictionary," and, for this reason, they have, from time to time, issued revisions under the lead of distinguished scholars. By their enterprise and painstaking care they have kept the International the standard authority wherever the English language is spoken. Whether for the use of the busy man of affairs or the scholar in research, Webster's has remained, as President Eliot, of Harvard, has described it, a "wonderfully compact storehouse of accurate information." It is recognized as the standard by the United States Supreme Court, by the United States Government printing office in Washington, by the English Government as the standard in the Postal Telegraph Department—the only department having an absolute standard—by nearly all the presidents of universities and colleges, and by every State superintendent of schools.

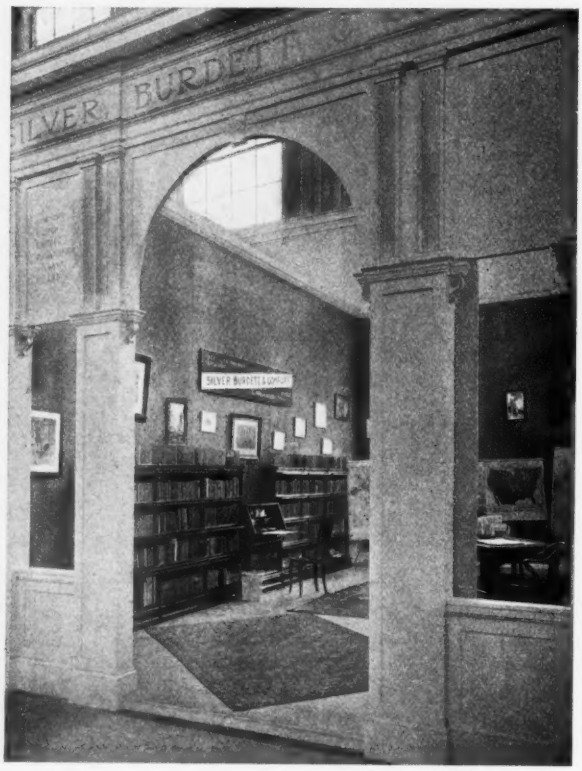
"Webster's Dictionary" has a comfortable and suitable home in the Education Building a roomy booth being given up to its exhibit. A bust of Noah Webster occupies the place of honor at the rear of the booth. On the wall below hang the various diplomas won at the World's Fairs, from the Centennial, in 1876, down to the Pan-American. There are also pictures showing plates of the different editions, and testimonials from a large number of well-known people, including John G. Whittier, William McKinley, George F. Hoar, Hamilton Mabie, Robert Grant, Justice Brewer, William D. Howells, Chief Justice Fuller, and Heber Newton. Wu Ting Fang writes that, on his trip to America, he was carrying a "Webster's Dictionary," which he had brought from China. A group of three portraits shows the original members of the firm of publishers, George, Charles, and Homer Merriam, and there is a large picture also of William T. Harris, United States Commissioner of Education, who was editor-in-chief of the new edition.

WEBSTER DICTIONARY EXHIBIT

The newest form in which Webster's has appeared is the thin-paper edition of the "Collegiate Dictionary," in which, by the employment of the expensive Bible paper, here used for the first time in a book of this kind, the size of the volume has been reduced more than one-half. As all the world knows, the G. and C. Merriam Company, Springfield, Mass., are the publishers.

SCHOOL BOOKS THAT SHAPE A NATION

LITERALLY miles of exhibits in the Educational Building are devoted to examples of work produced in various schools, all over this and foreign countries, and almost every visitor, no matter what his birthplace or nationality, can see what the children and young men and women are doing today in his native schools and colleges. In many cases, also, the line of progress can be followed and the improved methods noted. The company that has taken a prominent part in progressive educational movements, where they have not actually been the instigators of improved methods, has an exhibit on the north aisle of the same building.



THE SILVER, BURDETT & COMPANY EXHIBIT

Silver, Burdett & Company, of New York, have fitted up a library where their publications may be examined with comfort by those interested in educational matters. The lovers of good literature in general will also find on their shelves many interesting books.

Ranged along the wall are many interesting charts which graphically show the historical development of many countries—geographical charts that are so clearly printed and colored that even the less important geographical points can be located without difficulty. Wide readable music charts teach the young idea how to read music at sight.

On the walls, over the bookcases containing a full line of the firm's educational, religious, and general books, are hung some fine portraits and originals of illustrations used in their publications.

Though the St. Louis World's Fair is an exposition of processes rather than products, it is impossible to show the evolution by which Silver, Burdett & Company, through its twenty years' experience, has arrived at its twentieth-century state of usefulness and standing. It is easy, however, to study their text-books and then go over and examine the work of many schools which use them as foundations of their systems of teaching.

The exhibits of educational work are inspiring and cheering, showing, as they do, the increase in culture along practical as well as in purely intellectual lines, among all nations. With this splendid work Silver, Burdett & Company has had, and now has, much to do. The Company has done the American community an important service in offering books which make available to school-children and older students the standard works of literature and history in a convenient and inexpensive form. Text-books that teach with interesting as well as significant material, and literary classics, are published in comfortable volumes provided with illuminating editorial notes.

THE FALL OF THE TOWER OF BABEL

A VISITOR to the World's Fair inquired earnestly of a Japanese as to some feature of his exhibit, and was much surprised to learn that the Japanese spoke but his own language and French. It had never occurred to him before that there would be any difficulty about language, and, for the first time, he realized fully the international character of the Exposition.

That others are fully aware of the value of knowledge of foreign languages, as well as the niceties of our own, is shown by an exhibit in the Palace of Liberal Arts. Here the Webster's "New Standard Dictionary," French and English, Spanish and English, German and English, and other dictionaries, besides many other books of reference and literature, are shown by Messrs Laird & Lee, of 263 Wabash Avenue, Chicago.

THE WORLD'S GREATEST LEXICON
UNIVERSITIES EDUCATORS PRESS & PUBLIC
CHICAGO U.S.A. LAIRD & LEE PUBLISHERS
DICTIONARIES ENGLISH FRENCH SPANISH GERMAN

EXHIBIT OF LAIRD & LEE

In a room that has all the inviting characteristics of a library, the various publications of this well-known firm, which range from the standard authors of the olden times to the modern masters, are placed in orderly rows on convenient shelves, or laid so suggestively on tables that it is well-nigh impossible to pass without stopping. The color shown is dark green, the woodwork, carpet, and wall-covering being in the same general tone, and it is infinitely restful after the glaring sun and brilliant reflection of the heated outdoors. This house also leads in World's Fair specialties: "Uncle Bob and Aunt Becky's Trip and Strange Adventures," "Glimpses," 200 Classic Gems, a work of art and beauty, reproduced in natural colors and tints, and "Standard Guide and Time-Saver." Among other publications—technical, scientific, and reference works pertaining to the trades and professions, electricity, engineering, cyclopædias, diaries, etc.

In this attractive exhibit may be settled all those important points in English and other languages that create so much discussion. Visitors and exhibitors from other countries will be able to know just what phrases to use by consulting the handy foreign and English Dictionaries published by this firm. The combination lexicons issued by Laird & Lee tend to bring foreign nations into closer relations with us. Their publications are sold the world over, and we might say they mark the progress to the end of that confusion of languages that has lasted since the days of the Tower of Babel.

THE NATURE LIBRARY IN THE FORESTRY BUILDING

DOUBLEDAY, PAGE & COMPANY'S BOOTH IN THE FORESTRY BUILDING, ST. LOUIS EXPOSITION

THE NATURE LIBRARY IN THE FORESTRY BUILDING

NOT many years ago the methods employed for the reproduction of pictures as illustrations for books and magazines were so crude that the finest literary productions were published without embellishment, causing a great loss in the artistic effect and graphic value of the text. Gradually these crude methods have given way before constant efforts at improvement, until the present-day half-tone illustration is almost perfect in its reproduction, not alone of the line and form of the original, but of its tones and shades as well.

At the root of this vast improvement was the perfection of photography, which today has reached such a stage that natural beauties are really transferred to paper without any loss of artistic effect.

But more marvelous still than this development of the art of black-and-white reproduction has been the perfecting of combination of color-printing and the photography of colors into a process of the so-called three-color printing which allows not only the exact reproduction of the lines, but of colors of any object.

The illustrative work exhibited in Doubleday, Page & Company's magazines, THE WORLD'S WORK and COUNTRY LIFE IN AMERICA, shows the finest results of the half-tone process that it is possible to obtain, and, because of the truthfulness of this method of illustration, only photographs are reproduced in these magazines.

Probably, the most attractive feature of our exhibit at St. Louis is the sample of color illustration from "The Nature Library," shown in the two towers at the corners of the booth. Four hundred of these illustrations are reproduced in the library in the full colors of nature, directly from the actual flower, insect, bird or butterfly, and are surpassingly beautiful in their exact transference of Nature's wonderful colors to paper. They are the example *par*

excellence of color illustration. The tremendous advantage of this method of illustration of a work on Nature is best shown by the small reproduction, herewith, of a color plate from "The Butterfly Book." In this picture, butterflies, in their exact natural colors, are shown in their exact natural positions. It can, therefore, be understood that any one having read, with this picture before him, the description of any species, will immediately recognize the species when met with in nature. Hence the claim that "The Nature Library" brings Nature directly into the home in winter as well as in summer.

It is small wonder, therefore, that the eminent authority on all subjects relating to nature, Mr. John Burroughs, should say in his introduction to "The Nature Library," "the colored plates are as helpful as those of Audubon or Wilson," and that "the library is a safe guide to the world of plant and animal life that lies about us."

Besides these 400 colored plates, the library contains reproductions of some of the most remarkable photographs that have ever been made. In the "Animal Book" alone are many reproductions of photographs (the result of three years' work by three or four experts) which can never be duplicated, and "The Fish Book" contains the first successful pictures of live fish, the photographs actually having been made through the water.

The booth at which these magazines and books are exhibited at St. Louis is located in the centre of the Forestry Building, the most appropriate spot in the Exposition for the display of publications dealing with outdoor subjects. The limitations of this article will not allow of explanation in detail of the three-color process by which such beautiful results have been obtained, but those in charge of our exhibition will most gladly welcome all callers, and will explain the various processes and printings involved in the production of one of the really notable publications of the time.

REDUCTION OF THE COLORED FRONTISPIECE IN "THE BUTTERFLY BOOK"

We shall be happy to send you full particulars, and a most attractive book describing the Library. Here is what people say of the Nature Library:

"Really I had no adequate idea of the scope and beauty of The Nature Library.

"Every volume of the set is so clearly written that it would interest even a small child. The illustrations, true to the nature of the subject, seem to imbue one with a thirst to read, and to have it as a reliable guide to the haunts and homes of birds, animals, flowers, etc."

C. J. FORLONG, Buffalo, New York.

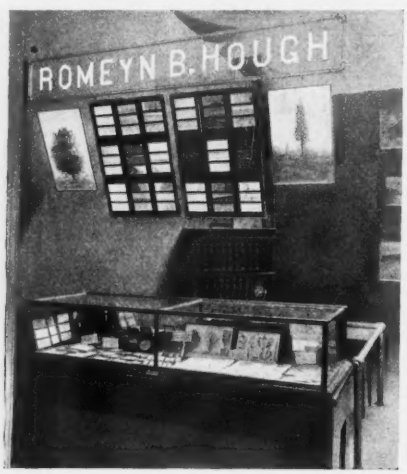
"A superb set of books which are designed especially to help those without scientific training to comprehend the beauties and wonders of nature. The illustrations have created a new epoch in colored pictures direct from photographs, and the text is uniformly interesting and instructive."

MRS. ANNA BOTSFORD COMSTOCK,
Cornell University

"As necessary as the dictionary, but far more interesting"

"STORIES IN TREES"

A PURELY unique exhibit at the Louisiana Purchase Exposition, and one indicative of valuable original work, is that of Romeyn B. Hough, of Lowville, N. Y. It is located in the Forestry Building, Block 34, and is of unusual interest. One may see there a publication, entitled "American Woods," on the trees of the United States, *illustrated by actual specimens* of their woods. The specimens are transverse, radial and tangential sections, thin enough to allow the transmission of light, and beautifully revealing characteristic structures, colors, etc. They are mounted in separable pages, and an accompanying text gives full information as to botanical characters of the various trees, their distribution, uses, physical and medicinal properties, etc. The specimens and texts are gathered into neat cases, resembling clasped books, each covering twenty-five species, and can be kept on a table or library shelf like ordinary books. In the accompanying illustration of Mr. Hough's booth, some of the specimen-pages are shown, mounted as transparencies and closed books in background.



AN EXHIBIT OF "AMERICAN WOODS"

The gathering of the woods for this work Mr. Hough makes his personal duty, and he assures their scientific value. The sectioning is done by a machine and process of his own device. He prepares, also, sections of woods for *stereopticon* and *microscope*. The former enable one to portray perfectly upon the screen—projected from nature itself—characteristic wood structures. The latter reveal literally "a world of wonder" in the minute structure of woods.

When Mr. Hough is gathering his woods, he carries with him a camera, that he may secure pictures of particularly interesting trees and groups of trees, showing habits of growth, etc., and the result has been the acquisition of a series of pictures of rare value to the student of trees. He is bringing these out as photogravures in a work entitled "Tree Studies," and (when specially ordered) as photographs, stereopticon views, and transparencies. Two of the last mentioned are shown in our illustration, one being of an isolated Silver Maple and the other an Incense Cedar, with the dome of Mt. Shasta in background. They are issued in two series, as follows: Series A is of typical trees showing characteristic habits of growth—an interesting study to the nature student—the deciduous species being shown both in leaf and leafless. Picturesque landscapes and surrounding objects of interest are often included and mentioned in the labeling. A near view of the trunk is then made to show characteristic bark, a one-foot rule being displayed to indicate size. Series B covers leaves, flowers, fruits, and winter buds, natural sizes being indicated by an original and very satisfactory method. These pictures are made from fresh specimens, even before their wilting, and with such care and skill that minute details are vividly portrayed. These pictures enable easy identification by comparison. Mr. Hough has in preparation a *hand-book* on our trees in which such of these pictures as are essential for identification purposes will appear with much original matter. It will be equally useful to specialist and amateur. Mr. Hough also supplies wooden cross-section cards for all fancy and business purposes.

Parties interested are referred to his exhibit, or if addressed at his home he will send samples and full information.